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FIRE MANAGEMENT PLAN

FRANK CHURCH —
RIVER OF NO RETURN
WILDERNESS

Intermountain Region

Northern Region

~~1990~~
1987

FRANK CHURCH - RIVER OF NO RETURN WILDERNESS

FIRE MANAGEMENT PLAN

Tom Patten & Mike Oliver

MAY 1987

USDA FOREST SERVICE
Intermountain Region and Northern Region

Cover Illustration: Crystal Lake, Aviation and Fire Management
Missoula, Montana

FRANK CHURCH-RIVER OF NO RETURN WILDERNESS
FIRE MANAGEMENT PLAN
FY-90 REVISIONS

Prepared by Tom Patten and Mike Monahan in co-operation with representatives from each of the six Forests and both Regional Offices.

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Recreation & Lands R-4

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Approved by:

Regional Forester, R-1 Date 3/10/90

Regional Forester, R-4 Date 3/23/90

REVISIONS
5/87

The following revisions have been made to the Frank Church - River of No Return Wilderness Fire Management Plan. These changes are a result of the Fall, 1986 FC-RONR steering committee meeting held in McCall, Idaho, and have been agreed to by the Fire Managers of the units involved. They represent the accumulation of experience gained since the initial implementation of the plan and are intended to improve the managers ability to implement the objectives. The following changes will be effective during the 1987 field season:

For fire behavior purposes, the data from the Skull Gulch Remote Area Weather Station (RAWS) has been determined to be more representative of actual fire behavior conditions in the FC-RONR than the Indianola weather station. In 1987, Skull Gulch indices will be used in lieu of Indianola.

In the river corridor zones the Energy Release Component (ERC) guideline has been changed from the 60th percentile to the 80th percentile. This more nearly reflects the point at which fire behavior may be approaching an unacceptable level.

The text in the Prescription Criteria has been clarified to explain the role that ERC plays in the final decision on whether or not an ignition will receive prescribed fire or wildfire status.

The text in the Prescription Constraints has been clarified to explain the meaning of "RESOURCES AVAILABLE" in the Fire Management Unit decision flow charts.

As Agreed To By:

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Dale Armstrong
Staff Officer, Aviation, Fire, Engineering and Minerals - Challis NF, R4
Gene Benedict
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FIRE MANAGEMENT PLAN

Frank Church - River of No Return Wilderness

Prepared by Tom Patten and Mike Oliver in cooperation
with representatives from each of the six Forests

Prepared by:

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Forest Supervisor, Payette N.F.

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Forest Supervisor, Salmon N.F.

Approved by:

Regional Forester, R-1 — Date 7/3/85

Regional Forester, R-4 — Date 7/3/85

DECISION NOTICE
and
Finding of No Significant Impact

USDA Forest Service
Intermountain and Northern Regions

Fire Management and Protection Program for the Frank Church-River of No Return Wilderness located in:

Region 1	Region 4
Bitterroot NF	Boise NF
Nezperce NF	Challis NF
	Payette NF
	Salmon NF

An environmental Assessment that discusses the proposed action of returning fire to its more natural role was completed for the Frank Church-River of No Return Wilderness Management Plan. This Fire Plan is tiered to that Wilderness Management Plan. A copy of the assessment is available for public review in the Forest Service Offices listed above.

Based on the analysis and evaluation described in the environmental assessment, it is our decision to adopt alternative C of the FC-RONR Wilderness Fire Management Plan for allowing some lightning-caused fires to play a more natural role in these wilderness ecosystems and to allow planned ignition prescribed fire when and where it is appropriate. This Fire Plan identifies the specific measures to be taken in implementing this alternative.

Alternative C, with specified mitigation measures and monitoring, provides the best combination of physical, biological, social and economic benefits and is considered to be the environmentally preferable alternative.

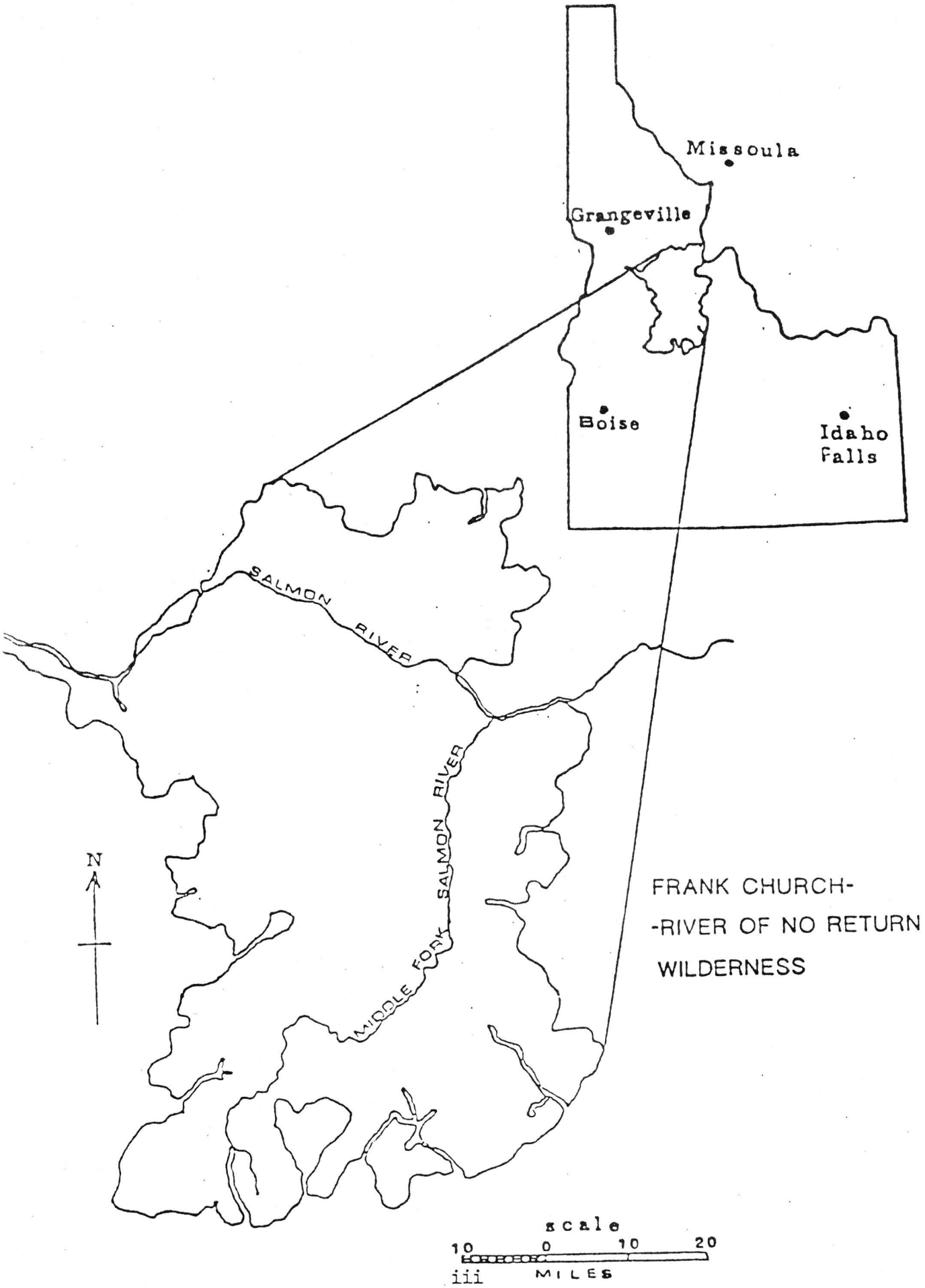
We have determined through the environmental analysis that this is not a major Federal action that would significantly affect the quality of the human environment, therefore, an environmental impact statement is not needed. This determination was made considering the following factors: (a) the physical and biological effects are confined to the Wilderness or their proposed additions; (b) coordination is provided for with those responsible for air quality, thus maintaining the effects of smoke outside the Wilderness to acceptable levels, (c) the physical and biological effects of fire are natural to the ecosystems of these Wildernesses; (d) public safety and property protection are adequately accounted for within the realm of the "Wilderness Experience"; (e) the selected alternative provides for adequate fire manageability through its contigency plan provisions; and (f) the long-term effects on threatened or endangered plants or animals are positive.

Project implementation is planned for the 1985 fire season.

Regional Forester R-1 Date 7/3/85

Regional Forester R-4 Date 7/3/85

VICINITY MAP



FRANK CHURCH -
RIVER OF NO RETURN
FIRE MANAGEMENT PLAN

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FIRE MANAGEMENT SITUATION

ACKNOWLEDGEMENTS

The completion of this plan has required the diligent effort and team work of many people. The coordinated effort of 2 Regions, 6 National Forests, and 12 Ranger Districts made the Plan possible.

We want to thank the Frank Church - River of No Return Wilderness Planning team, especially Frank Elder and Lew Campbell for their support and direction.

We wish to thank all members of the Steering Committee especially the Chairman, Bob Mutch, for his continued support and direction.

Many people provided technical support in the development of this plan. Sincere thanks is extended to all members of the Working Group who provided the necessary information (maps, fuel types, etc.) to assemble the Fire Management Plan.

Thanks goes to the Intermountain Fire Sciences Laboratory for funding the fire history studies.

Special thanks goes to several persons who provided technical reports or services:

Bill Adams - Salmon National Forest - for his support and cartographic services.

Tina Schwartzman - Bitterroot National Forest - for her contributions to the public involvement process.

Sherry Tennant, Cam Toavs, Rita Underwood, Ramona Mena, Devonna Ericson, Candy Sargent, and Don Beberniss - Bitterroot National Forest - for their assistance in data processing.

Jim Saveland - Nezperce National Forest - for his contribution of the economic analysis of this plan.

Dr. Bruce Kilgore - National Park Service - for his interpretations and coordination of the fire history studies.

Steve Barrett - Systems for Environmental Management - for his contribution of the fire history studies.

Special thanks is extended to Richard T. Hauff, Salmon National Forest Supervisor, and Robert S. Morgan, Bitterroot National Forest Supervisor, for providing time and financial support of the Working Group Leaders.

Thanks to all those who reviewed the plan and took time to provide comments and constructive critiques.

We also want to thank our families for their continued support and personal sacrifices during the planning process.

FIRE MANAGEMENT UNITS

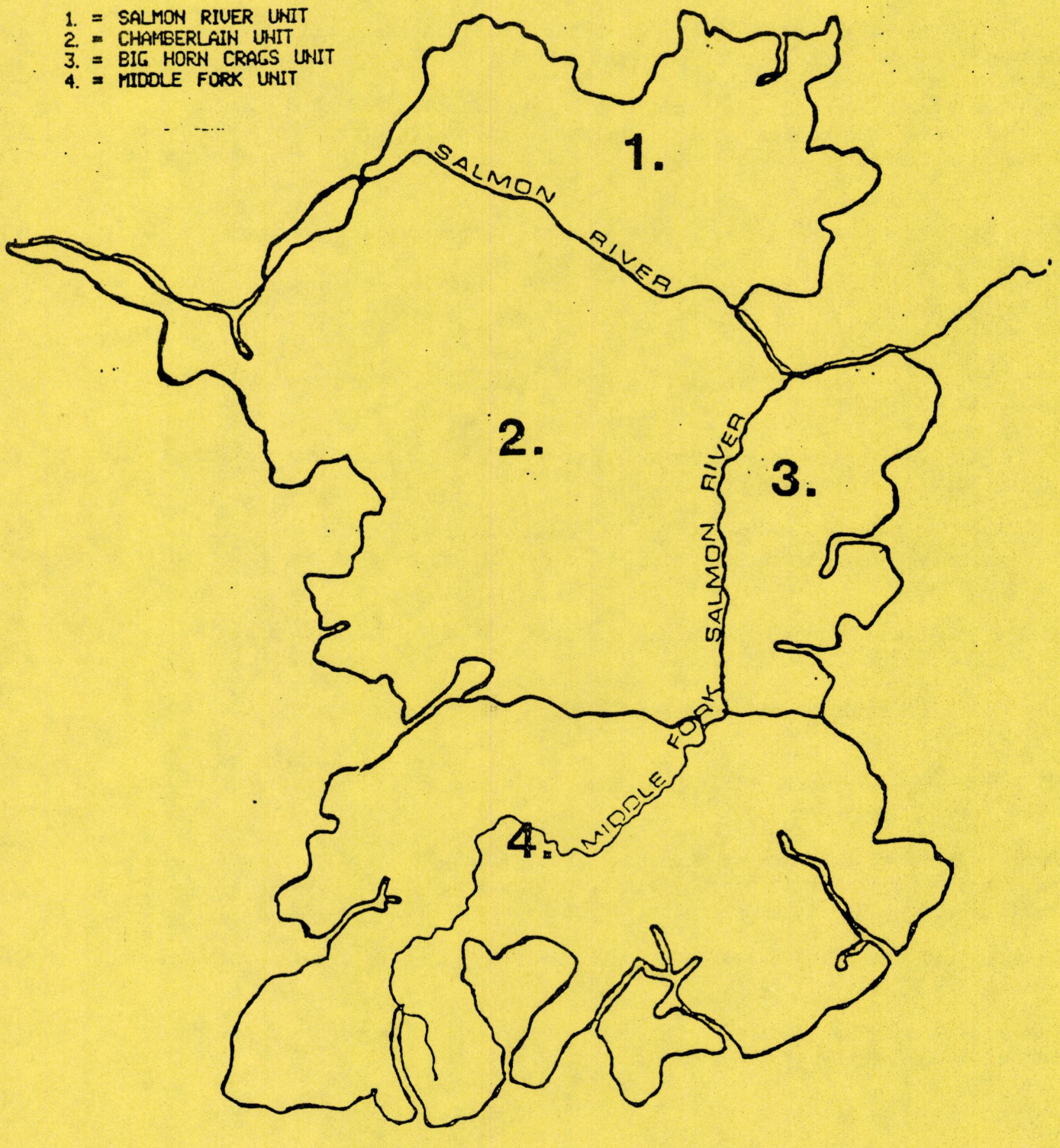


Figure 1

INTRODUCTION

PURPOSE - This plan provides a working guide for fire management within the Frank Church - River of No Return (FC-RONR) Wilderness. The plan is divided into two major sections, the Fire Management Situation and the Fire Management Action Plan. The Fire Management Situation section describes the present fire situation, the role of fire in the past, and the implications of the implementation of this plan. Also included in this section are the specific fire management objectives for the FC-RONR Wilderness and descriptions of the fire management units. The Fire Management Action Plan provides detailed direction and guidance for the management of prescribed fire within the FC-RONR Wilderness. This section contains criteria for management of prescribed fire for both planned and unplanned ignitions. Specific fire management prescriptions are displayed for each fire management unit. Monitoring, evaluation, contingency, and inform and involve procedures are outlined in this section. This section also provides direction for fire prevention, detection, and suppression operations within the FC-RONR Wilderness.

SCOPE - The Fire Management Area addressed in this plan is the 2,353,739 acre Frank Church - River of No Return Wilderness. This plan is a comprehensive plan that is a companion document to the Frank Church - River of No Return Wilderness Management Plan and the individual Forest Plans. These plans serve as the environmental documents to which this plan is tiered. This plan will become an appendix to the individual Forest Plans and the fire management prescriptions and their associated decision criteria will be included in the individual Fire Management Action Plans.

AREA DESCRIPTION - The FC-RONR Wilderness encompasses 2,353,739 acres of Federal lands in central Idaho. Portions of Custer, Idaho, Lemhi, and Valley counties lie within the area. The USDA Forest Service is responsible for administration and land management of the area. Two Forest Service Regions, the Northern Region (R-1) and the Intermountain Region (R-4), six National Forests, (Bitterroot, Nezperce, Boise, Challis, Salmon, and Payette), [see Figure 1A], and twelve Ranger Districts administer programs within the FC-RONR Wilderness.

The FC-RONR Wilderness covers an extremely large land mass and diverse physical and biotic communities are represented within the area. This diversity coupled with high recreation use, numerous private inholdings, flashy fuel types, and high fire occurrence in the river corridors adds to the fire management complexity of the area. Recreation use, especially white water boating on the Main, Middle Fork and South Fork of the Salmon River is very high. Big game hunting in the fall also brings increased use to the area. This high recreation use will increase the chances of visitors coming in contact with fire and smoke associated with a prescribed fire program. Private inholdings, generally located along major river corridors also require safeguards to protect life and property from smoke and fire. Grass and timber fuel types in the river corridors and high fire occurrence provide the setting for large, fast spreading fires (see Fire History).

The Wilderness has very diverse physical characteristics. It is dissected by two major river systems, the entire Middle Fork of the Salmon River (flowing

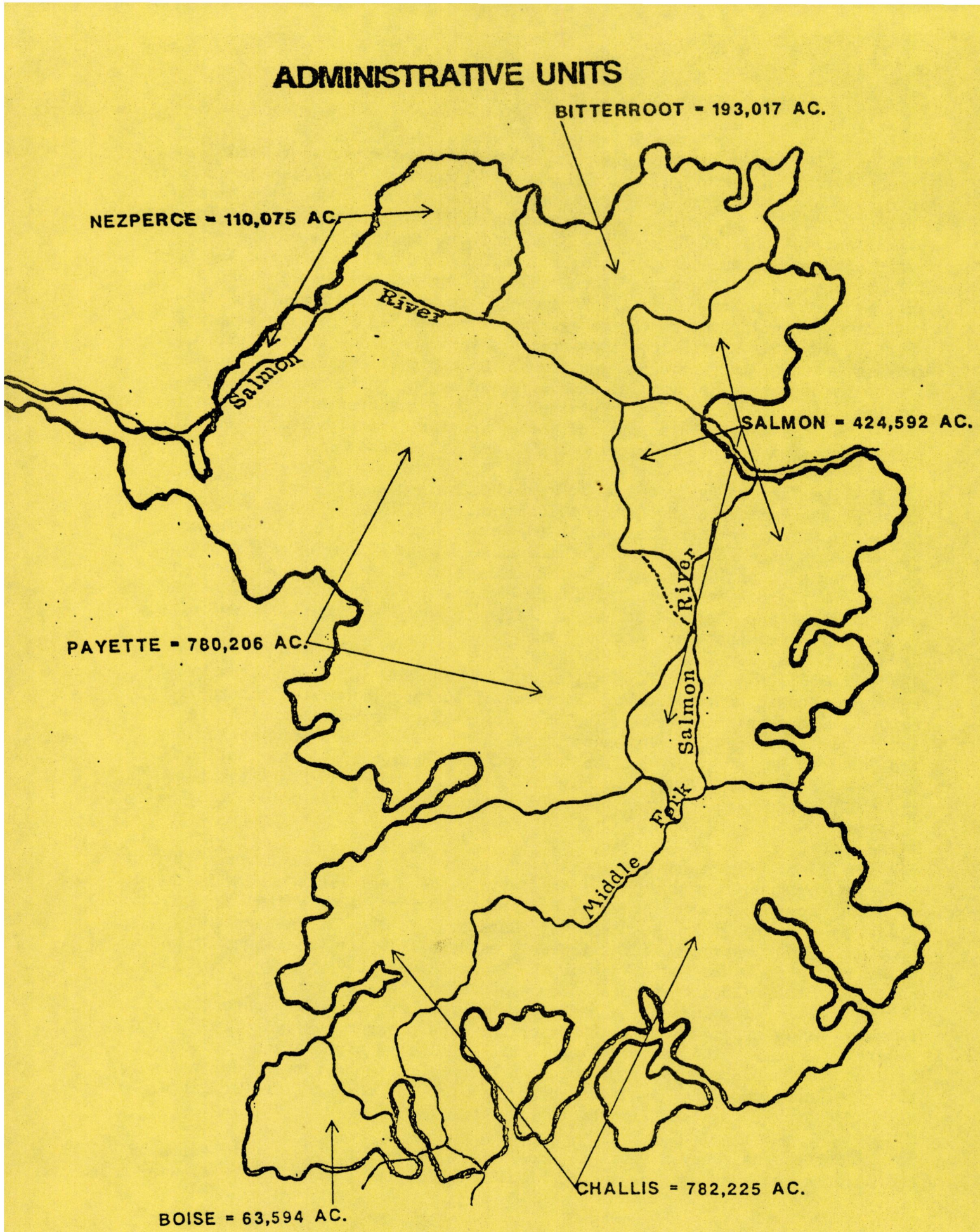

ADMINISTRATIVE UNITS
BITTERROOT = 193,017 AC.
NEZPERCE = 110,075 AC.
Salmon River
SALMON = 424,592 AC.
PAYETTE = 780,206 AC.
Middle Fork Salmon River
CHALLIS = 782,225 AC.
BOISE = 63,594 AC.

Figure 1A

south to north) and portions of the Main Salmon River (flowing east to west). The lower South Fork of the Salmon River and upper Selway River are also major drainages within the area. The river systems separate three major mountain ranges, the Clearwater Mountains and Bitterroot Mountains north of the Main Salmon River and the Salmon River Mountains south of the Main Salmon River on either side of the Middle Fork of the Salmon River. The interaction of these river systems and mountain ranges has created a physical environment with a variety of different physiographic areas (Figure 2), resulting in a diverse, interrelated Fire Management situation.

The FC-RONR Wilderness is adjacent to the Selway - Bitterroot Wilderness and the Gospel - Hump Wilderness. Both areas are north of the FC-RONR Wilderness. The Selway - Bitterroot and Gospel - Hump Wilderness Areas presently have approved operational Fire Management Plans. Coordination of this plan with these established plans is essential and is addressed in the Fire Management Action Plan.

OBJECTIVES - General objectives of the Plan are outlined in FSM 23 24.02:

1. Permit lightning caused fires to play, as nearly as possible, their natural ecological role within wilderness.

2. Reduce, to an acceptable level, the risks and consequences of wildfire within wilderness or escaping from wilderness.

Fire Management objectives within the FC-RONR Wilderness Management Plan established that the Wilderness Fire Plan would include and provide for:

1. The use of fire as a means of restoring and perpetuating natural ecosystems within the Wilderness.

2. Coordination with the Selway - Bitterroot and Gospel Hump Wilderness Fire Plans.

3. Development of a program for using prescribed fire, which may include both planned and unplanned (natural) ignitions to achieve wilderness objectives.

4. Direction regarding appropriate suppression responses (control, containment, or confinement), including any constraints on techniques, methods, tools, and equipment.

The FC-RONR Wilderness Fire Management Plan also includes the objectives:

1. Maintain cost effective prescribed fire and fire suppression programs within the Wilderness.

2. Provide a smoke management program that reduces the impacts of residual smoke on air quality.

FIRE HISTORY

The 2,353,739 acres of the FC-RONR Wilderness have experienced an average of 84.6 fires annually (74.7 lightning fires/year and 9.9 person-caused fires/year) from 1960 to 1983. This figure includes 2 Class C fires annually and .96 Class D fires annually. When compared to the total acreage of the Wilderness, the fire occurrence is not too significant. However, when the Wilderness was divided into smaller units, based on ignition potential, ignition patterns, and fire behavior potential, the occurrence history became very meaningful in the development of the Fire Management Units and Zones used in this plan.

The following bar graphs are based on fire occurrence history from 1960 to 1983. The first pair of graphs (Figure 2) illustrates average number of fires annually for geographic areas within the FC-RONR Wilderness and the established Fire Management Units. The second pair of graphs (Figure 3) illustrates the percent of Class C and Class D and larger fires in the geographic areas and the Fire Management Units.

Figure 2

Average Annual Number of Fires for Geographic Areas

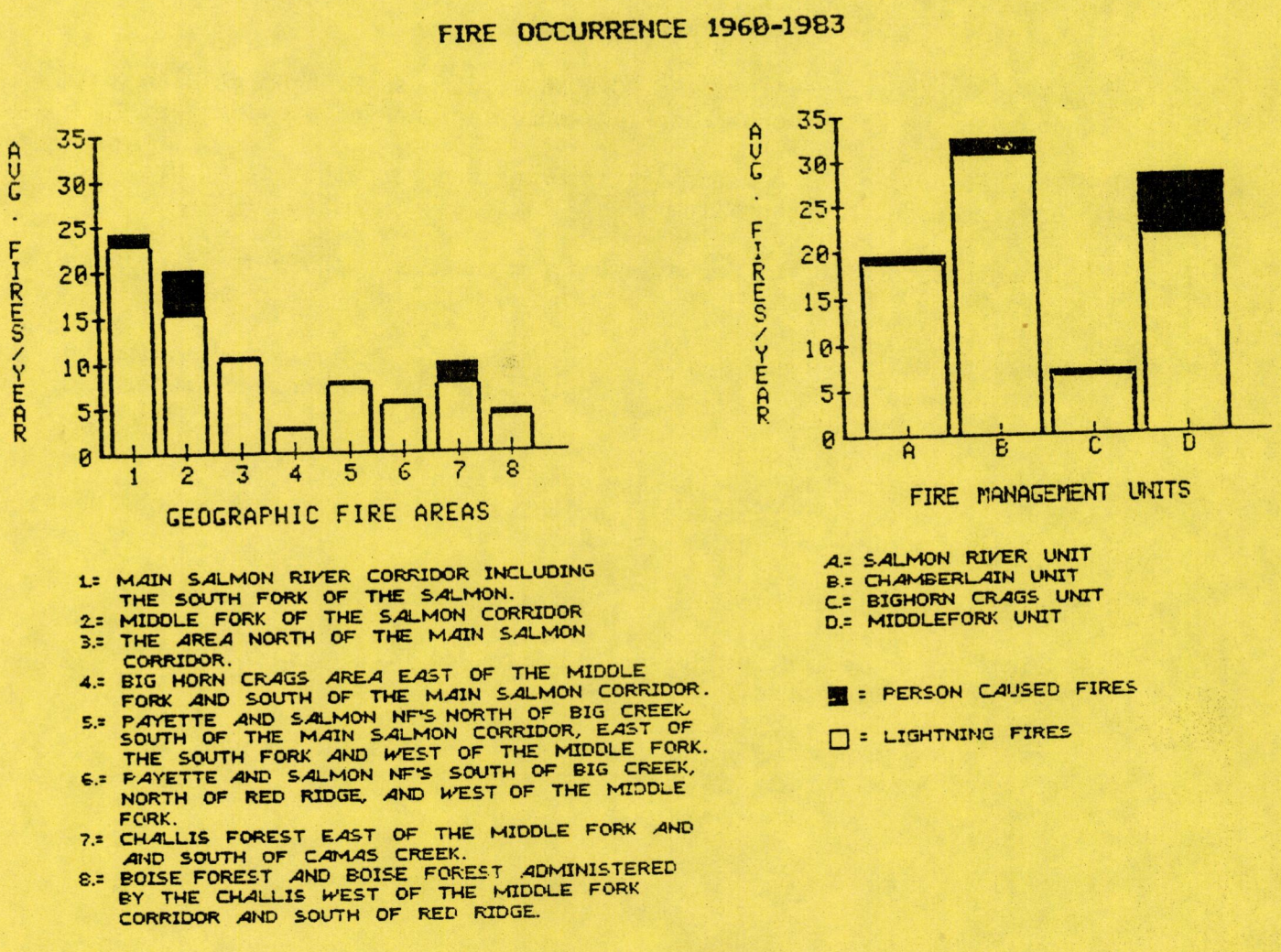
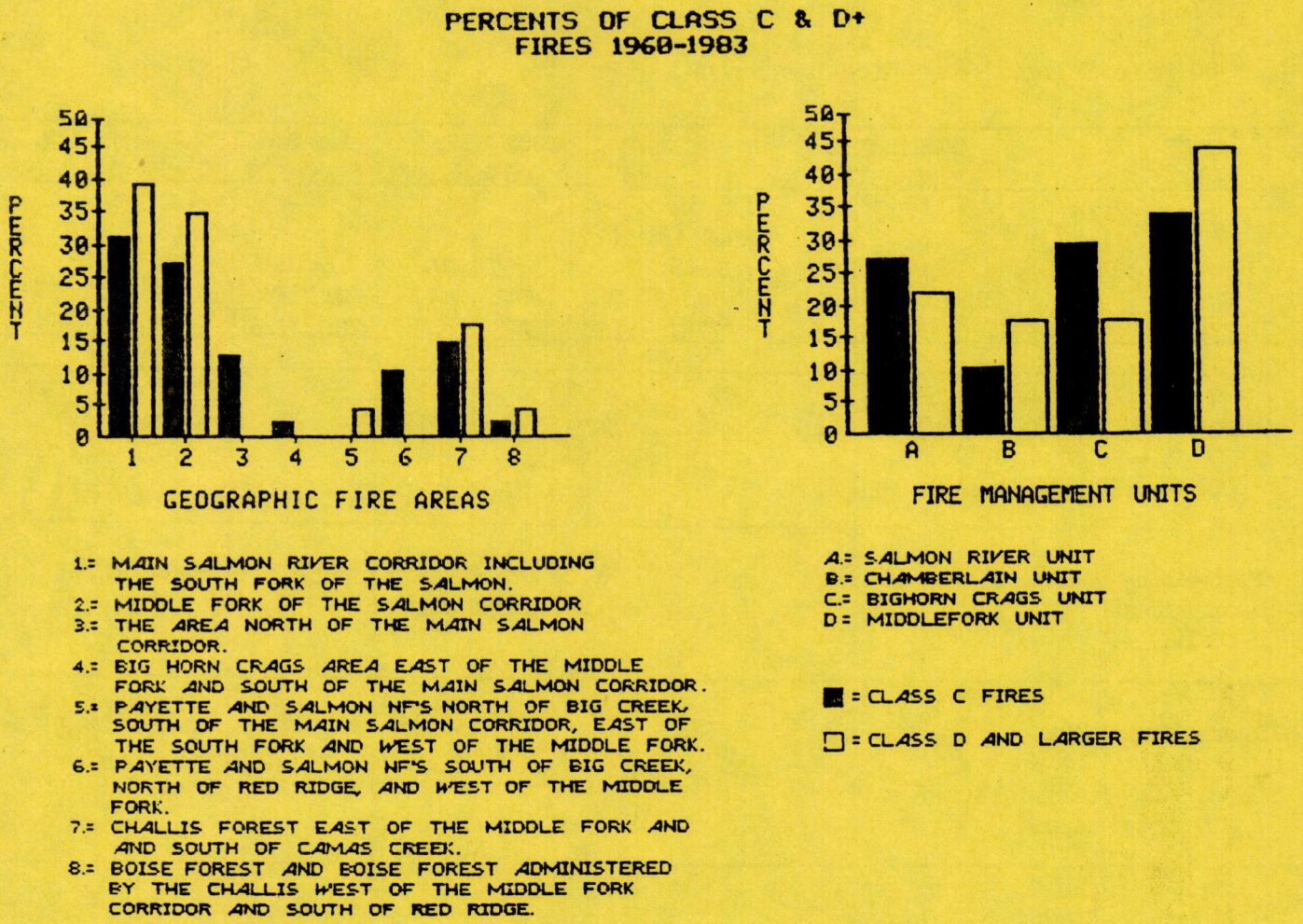

FIRE OCCURRENCE 1960-1983
AVG. FIRES/YEAR
35
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8
GEOGRAPHIC FIRE AREAS
A B C D
FIRE MANAGEMENT UNITS
1.= MAIN SALMON RIVER CORRIDOR INCLUDING THE SOUTH FORK OF THE SALMON.
2.= MIDDLE FORK OF THE SALMON CORRIDOR
3.= THE AREA NORTH OF THE MAIN SALMON CORRIDOR.
4.= BIG HORN CRAGS AREA EAST OF THE MIDDLE FORK AND SOUTH OF THE MAIN SALMON CORRIDOR.
5.= PAYETTE AND SALMON NF'S NORTH OF BIG CREEK, SOUTH OF THE MAIN SALMON CORRIDOR, EAST OF THE SOUTH FORK AND WEST OF THE MIDDLE FORK.
6.= PAYETTE AND SALMON NF'S SOUTH OF BIG CREEK, NORTH OF RED RIDGE, AND WEST OF THE MIDDLE FORK.
7.= CHALLIS FOREST EAST OF THE MIDDLE FORK AND AND SOUTH OF CAMAS CREEK.
8.= BOISE FOREST AND BOISE FOREST ADMINISTERED BY THE CHALLIS WEST OF THE MIDDLE FORK CORRIDOR AND SOUTH OF RED RIDGE.
A.= SALMON RIVER UNIT
B.= CHAMBERLAIN UNIT
C.= BIGHORN CRAGS UNIT
D.= MIDDLEFORK UNIT
= PERSON CAUSED FIRES
= LIGHTNING FIRES

Figure 3

Percent of Class C and D and Larger Fires


PERCENTS OF CLASS C & D+
FIRES 1960-1983
PERCENT
50
45
40
35
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8
GEOGRAPHIC FIRE AREAS
A B C D
FIRE MANAGEMENT UNITS
1.= MAIN SALMON RIVER CORRIDOR INCLUDING THE SOUTH FORK OF THE SALMON.
2.= MIDDLE FORK OF THE SALMON CORRIDOR
3.= THE AREA NORTH OF THE MAIN SALMON CORRIDOR.
4.= BIG HORN CRAGS AREA EAST OF THE MIDDLE FORK AND SOUTH OF THE MAIN SALMON CORRIDOR.
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6.= PAYETTE AND SALMON NF'S SOUTH OF BIG CREEK, NORTH OF RED RIDGE, AND WEST OF THE MIDDLE FORK.
7.= CHALLIS FOREST EAST OF THE MIDDLE FORK AND AND SOUTH OF CAMAS CREEK.
8.= BOISE FOREST AND BOISE FOREST ADMINISTERED BY THE CHALLIS WEST OF THE MIDDLE FORK CORRIDOR AND SOUTH OF RED RIDGE.
A.= SALMON RIVER UNIT
B.= CHAMBERLAIN UNIT
C.= BIGHORN CRAGS UNIT
D = MIDDLEFORK UNIT
= CLASS C FIRES
= CLASS D AND LARGER FIRES

MAIN SALMON FIRE HISTORY STUDY - The report "Fire History of the River of No Return Wilderness: River Breaks Zone" (Barrett 1984) (Appendix A) was formulated from field studies conducted on the Main Salmon corridor in Fiscal Years 1983 and 1984. The objectives of the study were to determine the fire history of several representative study areas below 6000 feet elevation by collecting samples from fire-scarred trees. This information formed the basis for interpretations about historic fire intensities, sizes, and frequencies. Another goal of this study was to develop interpretations about historic fire effects.

The following table (Table 1) summarizes the study report and illustrates the results of the study:

Table 1

1984 Main Salmon River Fire History Study Results

STUDY AREA	MASTER FIRE CHRONOLOGY					MAJOR FIRES >1000 ACRES			PRE-SUPPRESSION - PRE-1935 STAND FIRE HISTORY <100 ACRES		
NAME [ELEVATION]	SIZE IN ACRES	TIME PERIOD	NO. FIRES	MFI [YRS.]	MEAN YRS SINCE LAST FIRE	NO. FIRES	MFI YEARS	NOTE-ABLE YEARS	RANGE OF FIRE INTERVALS	RANGE OF STAND MFI	MEAN OF STAND MFI
Colson Creek [3200 ft.- 6000 ft.]	3000	1707-1919	59	3-6	61.9	11	21	1863 1880 1919	3-35	10-18	13.8
Chamberlain/ Dissapointment [6000 ft.]	4000	1730-1934	18	12	60.5	6	41	1846 1898 1919	5-52	15-36	22.5
Salmon River Corridor [2300 ft.- 3300 ft.]	Nine 100 Acre Units				56.7			1889 1919	2-95	10-48	19.9
Southern Exposures	North side 5 stands								2-39		13.9
Northern Exposures	South side 3 stands								9-95		30.9

Table 1 shows that the mean years since the last measurable fire in the three study areas is 2.7 to 4.5 times higher than the mean fire interval (MFI) of the stand. Barretts report suggests that fire suppression has interrupted the historic fire frequencies in some areas of the Salmon River Breaks since about 1930. Barrett further suggests that in south aspect stands, aridity seems to be preventing both Douglas-fir encroachment and heavy fuel accumulations. The stands are sparsely forested and even in fire's absence, scattered seedlings of ponderosa pine can be found in many areas. Duff accumulation probably is the

most serious result of the lack of fire in such stands. On north aspects however, dense regeneration of Douglas-fir is clearly replacing ponderosa pine in the understories of most stands. In these generally overstocked stands, living and dead downed fuels are undoubtedly increasing in the absence of frequent thinning fires.

The occurrence of large fires has not ceased in the Salmon River Breaks. The following table (Table 2) lists the Class D and larger fires that have occurred from 1960 to 1983:

Table 2

Class D and Larger Fires in the Salmon River Breaks

DATE	SIZE	LOCATION	FOREST	CAUSE
1. 7-19-60	1,750	Mackey Bar	Nezperce	Lightning
2. 7-24-61	10,500	Corn Creek	Salmon	Person
3. 8-28-61	810	Rabbit Point	Nezperce	Lightning
4. 7-20-62	1,765	Upper Alder	Bitterroot	Lightning
5. 8-06-63	190	5-Mile	Payette	Lightning
6. 7-28-69	960	Shell Creek	Salmon	Lightning
7. 7-10-72	1,620	Goat Creek	Salmon	Lightning
8. 9-14-80	1,000	Rattlesnake	Nezperce	Lightning
9. 7-06-83	183	Rugged Creek	Payette	Lightning

The total acreage for fires in Table 2 was 18,778 or an average of 782 acres annually. If the person-caused fire at Corn Creek is excluded the average annual burned acreage drops to 345. This can be compared to the historic burned average using the mean of stand MFIs for the north and south aspects measured against the river breaks acreage which is approximately 10 percent of the total FC-RONR Wilderness acreage or about 235,000 acres. The south aspect stands show a historic burned acre average of 8,453 annually, while north aspect stands show a historic annual average of 3,803 acres. This totals 12,256 acres annually, which is considerably higher than the average acreage for large fire occurrence in the last 24 years. This further supports the suggestion that fire suppression has altered the historic large fire occurrence patterns in the Salmon River Breaks.

FIRE MANAGEMENT UNITS

BACKGROUND - These descriptions define the general geographic location of the Fire Management Units and Zones that have been stratified in this plan. These descriptions along with the Fire Management Unit Map (Figure 1) show the spatial distribution of the Fire Management Units and Zones within the FC-RONR Wilderness.

GEOGRAPHIC DESCRIPTIONS

FIRE MANAGEMENT UNITS AND ZONES - A fire management unit is a geographic area where the management of fire is similar because of land types or administrative considerations. A fire management zone is a geographic area within a fire management unit that is delineated because fire management considerations and/or constraints differ within the unit.

Four Fire Management Units have been identified within the FC-RONR Wilderness Area:

1. SALMON RIVER UNIT - This unit is the portion of the FC-RONR Wilderness north of the Main Salmon River. The drainages in this unit generally flow to the south with the exception of the Selway River which flows north with its tributaries flowing generally east or west. This unit lies on portions of three National Forests, the Nezperce, Bitterroot, and Salmon. Major drainages in this zone that flow into the Main Salmon River include Bargamin Creek on the Nezperce National Forest, Sabe Creek, the boundary between the Nezperce and Bitterroot National Forests, and Horse Creek on the Salmon National Forest. The Selway River is another major drainage within the unit and it lies on the Bitterroot National Forest. The western boundary of the unit lies near the Gospel Hump Wilderness Area, separated by a corridor of non-wilderness. A large portion of the unit is bounded on the north by the Selway - Bitterroot Wilderness. Two Fire Management Zones within this unit have been identified.

   A. CLEARWATER MOUNTAINS ZONE - This zone is the portion of the Salmon River Unit that lies above the defined Salmon River fuel type and/or its associated fire behavior influence (see Fire Management Unit Maps, Appendix G).

   B. SALMON RIVER BREAKS ZONE - The River Zone is the portion of the unit that is generally defined as the Main Salmon River breaks or the area immediately adjacent to the Main Salmon River north to where the influence of the Salmon River fuel types and topography does not significantly dominate the fire behavior (see Fire Management Unit Maps, Appendix G).

2. CHAMBERLAIN UNIT - The Chamberlain Unit is the portion of the FC-RONR Wilderness that lies within the Payette National Forest and the portion of the Wilderness on the Salmon National Forest that is south of the Main Salmon River, west of the Middle Fork of the Salmon River and north of Big Creek. This is the largest of the units and is dissected by several major drainages, therefore creeks and streams

flow in all cardinal directions within the unit. Major drainages represented are: Chamberlain Creek, Big Creek, Monumental Creek and the South Fork of the Salmon River. The unit is bounded on the north by the Main Salmon River and on the east by the Middle Fork of the Salmon River. The southern boundary of the unit is the boundary between the Payette National Forest and the Boise and Challis National Forests, generally along Red Ridge. The western boundary of the unit is broken and difficult to describe geographically. This boundary is best defined as the portion of the FC-RONR Wilderness that is adjacent to non-wilderness on the Payette National Forest. Three Fire Management Zones have been defined within this unit:

A SALMON RIVER BREAKS ZONE - This zone is similar to the Salmon River Breaks Zone in the Salmon River Unit and extends south of the Main Salmon River to a defined boundary where the influence of the fuel type and topography of the river breaklands do not dominate fire behavior (see Fire Management Unit Maps, Appendix G).

B. LOWER MIDDLE FORK BREAKS ZONE - The breaklands of the Middle Fork of the Salmon River generally define this zone. This zone extends west from the Middle Fork to geographic regions where the river breakland fuel types and topography are not major factors affecting fire behavior (see Fire Management Unit Maps, Appendix G).

C. CHAMBERLAIN BASIN ZONE - The balance of the Chamberlain Unit exclusive of the Main Salmon River and Middle Fork breaklands describes this zone (see Fire Management Unit Maps, Appendix G).

3. BIGHORN CRAGS UNIT - The Bighorn Crags Mountain Range is the dominant topographic feature in this unit. The unit is the portion of the FC-RONR Wilderness south of the Main Salmon River, east of the Middle Fork of the Salmon River and north of Camas Creek. The eastern boundary of the zone is roughly along the rim of the Yellowjacket Mountains and Gant Ridge. The entire zone is located on the Salmon National Forest. Major drainages in the zone are Camas Creek on the southern boundary, Yellowjacket Creek, Wilson Creek, and Clear Creek. The Bighorn Crags Mountains form a north-south divide within the unit. The drainages on the western side of the unit generally flow west into the Middle Fork of the Salmon River. Drainages on the western side of the unit primarily flow east into Panther Creek. Drainages in the extreme north of the unit flow north into the Main Salmon River and drainages in the extreme south portion of the unit flow south into Camas Creek. Three Fire Management Zones are present within this unit:

A. SALMON RIVER BREAKS ZONE - This zone is similar in fuel type and general description to the Salmon River Breaks Zone in the Chamberlain Unit. The zone extends south from the Main Salmon River to the crest of the Main Salmon River breaks (see Fire Management Unit Maps, Appendix G).

B. LOWER MIDDLE FORK BREAKS ZONE - This zone is the geographic area directly adjacent to the Middle Fork of the Salmon River and extends east to the crest of the Middle Fork breaklands. (see Fire Management Unit Maps, Appendix G).

C. CRAGS ZONE - This zone is described by the portion of the Bighorn Crags Unit exclusive of the Main Salmon and Middle Fork of the Salmon breaklands (see Fire Management Unit Maps, Appendix G).

4. MIDDLE FORK UNIT - This unit is the portion of the FC-RONR Wilderness that is administered by the Boise and Challis National Forests. Red Ridge delineates a large portion of the northern boundary and the unit is generally bisected by the Middle Fork of the Salmon River. Major drainages within the unit include: Marble Creek, Indian Creek, Pistol Creek, Loon Creek, Rapid River, and Camas Creek. All of these major drainages are tributaries of the Middle Fork of the Salmon River. The Middle Fork generally flows south to north with its tributaries generally flowing either to the east or west.. Two Fire Management Zones have been identified within the unit:

A. UPPER MIDDLE FORK BREAKS ZONE - Like the Lower Middle Fork Breaks Zone this zone generally describes the area where fire behavior is influenced by the topography and fuel types associated with the Middle Fork of the Salmon River breaklands. The zone originates at the Middle Fork and extends up the canyon walls roughly to the 6500 foot level (see Fire Management Unit Maps, Appendix G).

B. PISTOL CREEK - LOON CREEK ZONE - This is the portion of the unit exclusive of the Middle Fork of the Salmon River breaklands. This zone lies on both sides of the Middle Fork and comprises the balance of the Middlefork Unit.

PHYSIOGRAPHIC LAND TYPES

BACKGROUND - The FC-RONR Wilderness is an extremely large land unit with a wide variety of topo-edaphic features. These descriptions acquaint the reader with general land types in the plan area. Many more land types actually occur on a smaller scale throughout the area than can be treated in this plan.

The FC-RONR Wilderness Management Plan - Analysis of the Management Situation (Elder et.al. 1983) recognizes 7 distinct Physiographic Areas within the FC-RONR Wilderness. These Physiographic Areas are broad descriptions of geographic areas with similar physical and climatic features. Many of these features strongly influence fire management considerations. These Physiographic Areas are:

1. Lower River Canyon Lands
2. Upper River Canyon Lands
3. Rolling Basin Lands
4. Low Relief Fluvial Lands
5. Steep Volcanic Lands
6. Steep Granitic Fluvial Lands
7. Strongly Glaciated Lands

The geographic locations of of these Physiographic Areas are shown in Figure 4.

LOWER RIVER CANYON LANDS - This land type typifies the Salmon River Breaks Fire Management Zone found within the Salmon River, Chamberlain, and Bighorn Crags Fire Management Units and the Lower Middle Fork Breaks Fire Management Zone in the Chamberlain and Bighorn Crags Fire Management Units. Elevations within this land type primarily range from 2000 to 7000 feet mean sea level (MSL). The slopes within this type are very steep with cliffy rock outcroppings common. High summertime temperatures are typical with a high average overall seasonal temperature. Average precipitation is low. The snowpack rarely persists throughout winter therefore, the fire season is generally longer than in higher elevation mountain types. Vegetation tends to be sparse except for higher elevation north aspect communities. Ponderosa Pine and/or Douglas-fir with grass/shrub understory represent characteristic communities. Residual smoke from long duration fires may cause air quality problems in the deep canyon lands typical of this area. These effects will be most pronounced during night-time inversions and periods of strong atmospheric stability.

UPPER RIVER CANYON LANDS - The Upper Middle Fork Fire Management Zone in the Middle Fork Fire Management Unit and upper portions of the Lower Middle Fork Fire Management Zone within the Chamberlain and Bighorn Crags Fire Management Units typify the Upper River Canyon Lands Physiographic Area. Elevations in this type range from 3600 to 8000 feet MSL. The slopes are steep but somewhat less steep than those found in lower Salmon River canyon lands. The climate is similar to lower canyon lands with low average annual precipitation and general

lack of a persistent winter snowpack. Vegetation is also sparse in this type with significant timber stands usually confined to draws and/or north aspects. Representative vegetation is mostly shrubs over grasses on other aspects. Residual smoke from long duration fires will present smoke management problems similar to those in the Lower Canyon Lands. Locally heavy residual smoke can be expected after down canyon air flow begins at night and during periods when atmospheric temperature inversions persist over the area.

ROLLING BASIN LANDS - The Chamberlain Basin area in the Chamberlain Fire Management Unit is the largest geographic area within the FC-RONR Wilderness Area that typifies this Physiographic Type. Other areas that are representative of this type include upper Bargamin Creek in the Clearwater Mountains Zone in the Salmon River Fire Management Unit and in the Bear Valley area in the Pistol Creek - Loon Creek Zone in the Middle Fork Fire Management Unit. Rolling topography with broad, convex ridgetops, broad concave drainages, and gentle slopes are characteristic of this land type. Elevations range from 5500 to 7500 feet MSL. Precipitation averages 20 to more than 30 inches annually. Average annual temperatures are cool with cold winters. Vegetation in this Physiographic Area is variable, but extensive areas are dominated by lodgepole pine stands. Subalpine fir dominated stands also represent a significant component of this land type. The understory is usually shrubs and/or forbs.

LOW RELIEF FLUVIAL LANDS - The middle Chamberlain Creek drainage area in the Chamberlain Basin Zone in the Chamberlain Fire Management Unit is representative of this land type. Other areas that are classified into this type are found in the Clearwater Mountains Zone of the Salmon River Fire Management Unit (see Figure 4). Mid to lower elevational zones are included in this land type. The topography is variable but in general upper slopes are moderate with low relief and lower slopes are often steep with greater relief. Average annual temperatures are moderate, but vary from climatic trends of the lower canyon lands to those of the rolling basin lands. Precipitation ranges from 20 to 45 inches annually. The snowpack may not persist all winter on the southerly aspects. The vegetation within this type is variable, however, much of the area is highly productive for conifers. The areas associated with this land type may also experience effects of residual smoke during long duration fires due to a "pooling" effect of down canyon air flow during temperature inversions.

STEEP VOLCANIC LANDS - Portions of the FC-RONR Wilderness that are south of Big Creek and west of the Middle Fork of the Salmon River in the Chamberlain and Middle Fork Fire Management Units and the upper Loon Creek area in the Pistol Creek - Loon Creek Zone of the Middle Fork Unit are described by this Physiographic Area type (see Figure 4). This type can be high elevation ranging from 4000 to 8000 feet MSL, but excludes the extreme high elevation glaciated types. The slopes are steep and rugged with pronounced topographic relief. The average annual temperature varies from moderate to cold. Precipitation ranges from 20 to 50 inches annually and moderate to deep snowpack is common. Vegetation varies from dense conifer stands at higher elevations to sparse conifer communities at lower elevations.

STEEP GRANITIC FLUVIAL LANDS - This Physiographic Area is widely distributed throughout the FC-RONR Wilderness and usually occurs at an elevational level immediately below high elevation strongly glaciated land forms. The geographic area south and east of the Middle Fork of the Salmon River and immediately west of Loon Creek (upper Little Loon Creek - Sheep Creek area) is one of the larger blocks of this land type. Other areas classified into this type include the eastern portion of the Bighorn Crags Fire Management Unit, portions of the Clearwater Mountains Zone in the Salmon River Fire Management Unit (generally associated with the Clearwater Mountains Range), the uplands between the Sheepeater Mountains area and the South Fork of the Salmon River in the Chamberlain Fire Management Unit, and Morehead Mountain and Artillery Dome areas of the Pistol Creek - Loon Creek Zone in the Middle Fork Fire Management Unit. The topography in this land type varies, but slopes are usually moderate to very steep with very high relief. Elevations range from 4000 to 9000 feet MSL. Average temperatures are moderate to cold. Precipitation ranges from 25 to 45 inches annually with most occurring as snow. Subalpine habitat types dominate this type with moderate to high productivity displayed.

STRONGLY GLACIATED LANDS - This Physiographic Type is present in all four of the Fire Management Units, primarily associated with prominent mountain "sub-ranges". Specific examples of this land type are the Bighorn Crags Mountains in the Bighorn Crags Fire Management Unit, the Sheepeater Mountains area in the Chamberlain Fire Management Unit, the Sheep Hill area in the Salmon River Fire Management Unit, and the Soldier Lakes area in the Middle Fork Fire Management Unit. Slopes are typically long and very steep characterized with glacial troughs, cirques, cirque lakes, and steep ridges. Elevations range from 7500 to 10000 feet MSL and generally represent the highest elevations in the FC-RONR Wilderness. Average annual temperatures are cold with a short growing season. Precipitation in this land type ranges from 20 to more than 30 inches annually, primarily occurring as snow. Subalpine habitat types dominate with low to very low productivity potential. Alpine turfs typically occur in unforested areas.

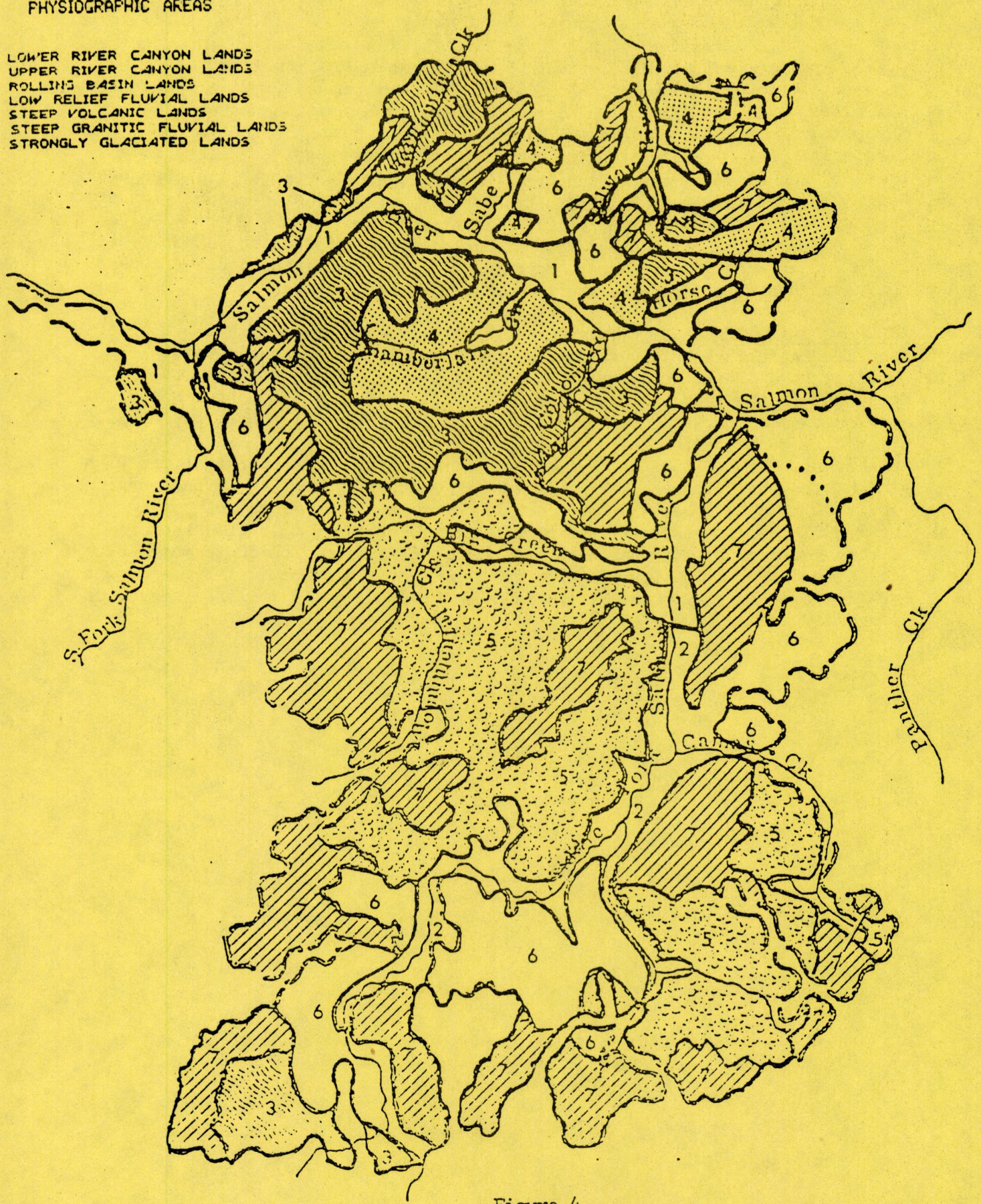

PHYSIOGRAPHIC AREAS
LOWER RIVER CANYON LANDS
UPPER RIVER CANYON LANDS
ROLLING BASIN LANDS
LOW RELIEF FLUVIAL LANDS
STEEP VOLCANIC LANDS
STEEP GRANITIC FLUVIAL LANDS
STRONGLY GLACIATED LANDS
Salmon River
S. Fork Salmon River
Panther Ck
Horse Ck
Camas Ck
Chamberlain
Sabe
Johnson Ck
Big Creek
Monumental Ck

Figure 4

FIRE ECOLOGY

FIRE GROUPS AND ASSOCIATED FUEL MODELS

BACKGROUND - The following descriptions address broad fire ecology and fuel models found within the FC-RONR Wilderness. The FC-RONR Wilderness is a vast area with considerable physical and biological diversity. It would require a document of great length to address site specific fire ecology because of this diversity. Broad descriptions of fuel models and fire groups found within the FC-RONR Wilderness will be discussed in this plan. Many fuel models and fire groups may actually occur within these broad groups; however, this plan only addresses the dominant models and groups.

The fire groups discussed in this plan have been described by Crane and Fischer in Fire Ecology of Central Idaho Forest Habitat Types (Crane and Fischer 1984). Fuel Models discussed are:

1. Fire Behavior Fuel Models - These are stylized models developed by the Intermountain Fire Sciences Laboratory. Fire Behavior Models simulate different fuel complexes represented by different fuel types. These models are based primarily on fire spread models and provide the land manager with fire behavior outputs derived from environmental and physical inputs.
2. National Fire Danger Rating System Fuel Models (NFDRS) - These models, like Fire Behavior Models, describe fuel types that exhibit different fire behavior characteristics. NFDRS Models are linked with daily weather data to provide indices of fire danger. These models provide the Energy Release Component index that is used in the prescriptions within this plan.

The following discussion will provide a broad description of the major fire groups and fuel models found within the FC-RONR Wilderness.

SALMON RIVER UNIT

SALMON RIVER BREAKS ZONE - This zone is generally dominated by Fire Groups Two and Three. These groups represent the warm, dry habitat types that support open forests of ponderosa pine and Douglas-fir and warm, moist ponderosa pine habitat types and warm, dry Douglas-fir habitat types usually dominated by ponderosa pine. Fire Group Two is characterized by an understory of grasses, usually with a sparse shrub component. Common grasses represented within this zone are bluebunch wheatgrass, Idaho fescue, and cheat grass. Shrubs include big sagebrush, mountain snowberry, and mountain mahogany. These timber-grass types are best classified into Fire Behavior Fuel Model 2 or 9 and NFDRS Fuel Model C. The primary role of fire within this zone is the maintenance of open stands. Periodic fires reduce the number of seedlings, remove understory trees, and may thin overstory trees. Fire also provides a mechanism of site preparation for natural regeneration. Fire exposes mineral soil, reduces competing vegetation, reduces seedling damaging insect populations, and increases nutrient availability. Periodic fire can create uneven-aged stands comprised of various sized groups of even-aged trees. Severe fires will

result in a predominantly even-aged stand. Fire in this zone or in similar types directly adjacent to this zone show mean fire intervals from 10 to 18 years (Barrett 1983). Modern fire suppression organizations and technology (past 50 years) have probably affected the composition of the stands within this zone. Lack of periodic fire has allowed fuel ladders to become established in some stands. Natural fuel loadings may also have been altered by fire exclusion. Lack of fire in this dry type undoubtedly leads to some degree of "un-natural" fuel accumulation. Areas previously dominated by fire maintained grasses may now be invaded by conifers. Some stands may be naturally open because moisture limits conifer productivity (Barrett 1983).

Fire Group Three within this zone is similar to Fire Group Two. This group is typically comprised of Douglas-fir habitat types dominated by fire maintained stands of ponderosa pine in this zone. In the absence of fire Douglas-fir will develop in the understory. The sites in this group are somewhat less dry than Fire Group Two and productivity is higher. The understory shrub component is more evident and diverse. Common shrubs are common snowberry, white spirea, Oregon grape, serviceberry, willow, and mountain snowberry. Fire's role is very similar to Fire Group Two with maintenance of wildlife forage becoming increasingly important. Fire Behavior Fuel Models 2 and 9 and NFDRS Fuel Model C also best describe this type in this zone. Fire histories in this type show mean fire intervals to be 13 to 16 years (Barrett 1983). Fire spread rates tend to be extremely high in both groups within this zone. This is primarily a function of both fuel type, climatic factors, and exceptionally steep slopes. Steep slopes also contribute to the downhill spotting that is typical of the zone.

CLEARWATER MOUNTAINS ZONE - Many fire groups are represented within this zone. Fire Groups Two and Three exist within this zone usually associated with major drainages, especially the Selway River. The fire implications of these fire groups are similar to those in the Salmon River Breaks Zone. The spread rates may be somewhat less in this zone where slopes are less severe. The role of fire is the same and tends to maintain open stands. Vegetation is similar with cheat grass less evident in the Selway drainage. Fire Behavior Fuel Models 2 and 9 and NFDRS Fuel Model C best describe these types.

Fire Group Four describes the cool, dry Douglas-fir habitat types beyond the normal range of ponderosa pine. This group is usually too cold for ponderosa pine except for lower elevations where it may be co-climax within the Douglas-fir/mountain mahogany habitat type. Stands in this group tend to be open and regeneration sporadic. Undergrowth may be sparse but is usually competitive with tree seedlings following disturbance. Typical grasses include: pinegrass, bluebunch wheatgreass, and Idaho fescue. Common shrubs are mountain snowberry, chokecherry, currant, big sagebrush, mountain mahogany, russett buffaloberry, common snowberry, willow, mountain maple, and snowbrush ceanothus. The climate is generally dry in this type. Tree growth is slow and sites are relatively unproductive. Lightning fires are usually infrequent in this type. Severe stand replacing fires appear to be likely in dense stands. Fire may have created and maintained open stands by thinning pole stands and periodically

removing understory seedlings. Severe fires leave soil exposed to accelerated erosion but serious soil effects should not be expected. Fire spread rates are moderate during dry periods.

Fire Group Five usually displays Douglas-fir as the major climax species. Douglas-fir also represents the major seral species in this group. Ponderosa pine can be a major seral species at low elevations and lodgepole pine at high elevations. Fire Group Five sites are more moist than Fire Group Four. This increased moisture allows the development of fully stocked, closed canopy stands. Regeneration after disturbance tends to be slow due to competition from grasses and shrubs. Common shrubs include: ninebark, mountain maple, service berry, Oregon grape, roses, mountain snowberry, blue huckleberry, dwarf huckleberry, twinflower, and bearberry. Pinegrass and elk sedge represent grass and grasslike components. Mean fire intervals are estimated to be 28 years with a range of 5 to 67 years (Arno 1976). Low to moderate intensity fires in this group would open dense stands of pole-sized or larger trees. Subsequent light burns would maintain these stands in a park-like condition. After long fire-free intervals, overstocked stands or open stands with dense understories can develop and severe stand replacing fires may result. Fire in these stands plays a major role in maintaining wildlife habitat, by opening stands and promoting the growth and rejuvenation of important browse species. Fire effects on soil are variable and soil specific. Granitic soils are prone to erosion and mass failure because of the moister conditions of this group compared to the drier groups. Following severe fire the deeper soil saturation and loss of root strength contribute to unstable soils.

Fire Group Eight is comprised of warm, lower subalpine habitat types typically dominated by Douglas-fir. A variety of conifers may dominate stands in this group. Common dominant tree species are Douglas-fir, lodgepole pine, and Engelmann spruce. Although not usually dominant, subalpine fir is the indicated climax species. Climatic conditions range from dry to moist in this group, thus, understory vegetation ranges from sparse to dense. Common shrubs in this group include: white spirea, common juniper, russett buffaloberry, mountain snowberry, blue huckleberry, Utah honeysuckle, Sitka alder, mountain maple, and mountain ash. Grasses and grasslike plants are represented by pinegrass and elk sedge. Little fire history for this fire group in this zone has been documented but fire return intervals may be 100 years or longer. Fire effects on vegetation are quite variable. Low to moderate intensity surface fires generally favor Douglas-fir over lodgepole pine. Severe fires favor lodgepole pine if serotinous cones are present. Some large, thick barked Douglas-fir may survive severe fires that kill all lodgepole pine present thus providing a seed source for future stands. Fire also sets back any invasion of the stand by subalpine fir and Engelmann spruce. Subalpine fir will dominate the stands in this group in the absence of fire. Fire spread rates in this group tend to be low to moderate. Fire Behavior Fuel Model 10 and NFDRS Fuel Model G are generally good descriptors for these fuel types. Fire Behavior Fuel Model 8 and NFDRS Fuel Model H provide good descriptions for stands of young lodgepole pine regeneration with relatively clean understories.

Fire Group Nine is characterized by the moist to wet lower subalpine habitat types. Stands within this group are mostly located on alluvial terraces, wet benches, bottomlands next to streams, or wet meadows. Engelmann spruce is usually dominant as a persistent seral species. Douglas-fir and lodgepole pine may also occur as seral species but to a lesser degree. Characteristic shrubs are prickly currant, blue huckleberry, menziesia, Labrador tea, bearberry, honeysuckle, and grouse whortleberry. A variety of herbs are abundant in the understory. Detailed fire history for this group is generally lacking; however, evidence suggests that fire in spruce habitat types of central Idaho is less frequent than on contiguous slopes (Steel, et. al, 1981). The wet understories found in this fire group normally do not support surface fires. Wind driven crown fires originating in adjacent stands may affect these stands. The fuel models represented in this type are similar to the moister Douglas-fir types with Fire Behavior Fuel Model 10 and NFDRS Fuel Model G representing stands with heavier fuels in the understory and Fire Behavior Fuel Model 8 and NFDRS Fuel Model H representing young lodgepole regeneration and sparse high elevation subalpine fir types.

CHAMBERLAIN UNIT

SALMON RIVER BREAKS ZONE - Fire Groups Two and Three are well represented in this zone as they are in the Salmon River Unit. Also represented within this zone are geographic areas where Fire Groups Five and Six extend from higher elevations down to the Main Salmon River. These latter fire groups generally occur on moister aspects or deep drainages. Fire Groups Two and Three are dominated by open stands of ponderosa pine as described in the Salmon River Unit.

Fire Group Five is moist Douglas-fir habitat types with Douglas-fir also being the major seral species. Ponderosa pine can also be a major seral species at lower elevations and lodgepole pine can be well represented at higher elevations. Common shrubs in this group include ninebark, mountain maple, serviceberry, Oregon grape, roses, and mountain snowberry. Some NFDRS Fuel Model G and Fire Behavior Fuel Model 10 can be found in these "stringers" that run to the Main Salmon River; however, in general terms they are best represented by NFDRS Fuel Model H and Fire Behavior Fuel Model 8. Fully stocked closed canopy stands are typical of this type. Low to moderate intensity fires in this Fire Group serve to open dense stands of pole sized or larger trees. Subsequent light fires maintain these stands in a park-like condition. In the absence of fire, overstocked stands, or open stands with dense understories, can develop, increasing the chances of a severe stand replacing fire. The combination of opening up stands by killing overstory trees, reducing competition by removing understories, and rejuvenating sprouting plants through top kill can significantly increase the availability of palatable browse and forage. Fire Group Five stands are typically found on coarse particle soils that are suseptable to erosion or mass failure when substantial vegetation is removed.

Fire Group Six is represented by the grand fir habitat types. These sites are generally more moist than the Douglas-fir habitat types. This group

tends to be floristicly diverse. Ponderosa pine, Douglas-fir, lodgepole pine, and Engelmann spruce are common seral components of this group in this zone. Common shrubs include white spirea, blue huckleberry, common snowberry, Utah honeysuckle, mountain maple, serviceberry, Scouler willow, ninebark, roses, twinflower, and myrtle pachistima. Fire history information is generally lacking for central Idaho grand fir stands.

On drier Fire Group Six types frequent surface fires maintained open stands dominated by fire-tolerant ponderosa pine along with some Douglas-fir. Some NFDRS Fuel Model G and Fire Behavior Fuel Model 10 exist within this Fire Group in this zone; however, the primary models will be NFDRS Fuel Model H and Fire Behavior Fuel Model 8. Soils in both groups are usually derived from either granitics or basalt and andesite.

LOWER MIDDLE FORK BREAKS ZONE - Fire Groups Two and Three dominate this zone and the fire ecology is very similar to the Salmon River Breaks Zone in the Salmon River and Chamberlain Units. Extremely steep slopes and open conifer with grass understory fuel types typify this zone. NFDRS Fuel Model C and Fire Behavior Fuel Model 2 are characteristic. Like the Salmon River Breaks Zone, fire spread rates tend to be extremely high during the general fire season. Downhill spotting is common due to the steep slopes and flashy fuel types.

CHAMBERLAIN BASIN ZONE - This zone, like the Clearwater Mountains Zone in the Salmon River Unit, is quite diverse and many Fire Groups are represented. Fire Group Seven occupies a large portion of this zone and is comprised of the cool habitat types usually dominated by lodgepole pine. This Fire Group is typified in this zone by subalpine fir and Engelmann spruce habitat types. Douglas-fir is found on some sites and ponderosa pine is a minor seral component. The common shrubs in this group are dwarf huckleberry, blue huckleberry, grouse whortleberry, Labrador tea, myrtle pachistima, Sitka alder, mountain snowberry, and big sagebrush. Pinegrass and Idaho fescue are typical grasses and beargrass is a common forb found within this group. Soils are frequently derived from granitic materials. This Fire Group is well represented throughout the Chamberlain Basin. Research indicates that mean fire return intervals for low to medium severity surface fires are generally between 25 and 50 years in areas with dry summers. Stand replacement fires are also common in this area. If fires are severe and large, fire favors lodgepole pine stands and regeneration of climax or other seral species are delayed due to a lack of seed source. Repeated fire tends to further deplete the seed source, leading to more uniform stands of lodgepole pine which become increasingly flammable. Fuels build up in mature lodgepole stands as a result of overcrowding, mortality caused by insects and pathogens, and deadfall from previous fires. Suppressed understories of subalpine fir and spruce create fuel ladders from dead surface fuels to the overstory. This condition eventually leads to a stand replacement fire. Stands within this Fire Group that are young or have light to moderate fuel loadings in the understory are best represented by NFDRS Fuel Model H and Fire Behavior Fuel Model 8. In stands that are breaking up because of age, fire, insects, or disease (where the fuels are generally heavy and ladder fuels

are common), NFDRS Fuel Model G and Fire Behavior Fuel Model 10 have been designated to represent the fuel type. These heavier fuel types are also found in other Fire Groups within this zone. Some representative areas of these heavy fuels in this zone are near Dry Meadow, Dillinger Meadow, Spring Meadow, and Meadow of Doubt on the Payette National Forest and the Butts Creek Point area on the Salmon National Forest.

Fire Groups Two and Three are also well represented in this zone in the South Fork of the Salmon River and Big Creek drainages. The fire ecology is essentially the same as the same type in the Middle Fork and Main Salmon Rivers. This area is typical of NFDRS Fuel Model C. Fire Behavior Fuel Model 2 is the characteristic fuel model in the Big Creek drainage. TheSouth Fork of the Salmon River is characterized by Fire Behavior Fuel Model 2, mostly concentrated near the mouth, and Fuel Model 9 upstream in the zone.

Fire Group Ten is present in the zone at upper elevations. Subalpine fir is generally the indicated climax species in this zone. Seral species include whitebark pine, lodgepole pine, spruce, and Douglas-fir. Stands are generally open with mountain gooseberry, grouse whortleberry, mountain snowberry, and big sagebrush being the most common shrubs. NFDRS Fuel Model H and Fire Behavior Fuel Model 8 best describes the fuel complexes in this group.

BIGHORN CRAGS UNIT

SALMON RIVER BREAKS ZONE - This zone comprises only a small portion of this unit and is generally characterized by Fire Groups Two and Three. It is similar to the same zone in the Chamberlain Basin Unit with the exception of the lack of the Fire Behavior Fuel Model 8 "stringers" running to the Main Salmon River. This zone is best described as a classic NFDRS Fuel Model C or Fire Behavior Fuel Model 2. The fire ecology is essentially the same as similar types in the adjacent Chamberlain Basin and Salmon River Units.

LOWER MIDDLE FORK ZONE - Fire Groups Two and Three dominate this zone. These dry ponderosa pine and Douglas-fir habitat types are similar to the river breaks associated with the south aspects of the Main Salmon River. Slopes are extremely steep and fire spread rates are very high due to the topography and grass understory. The fuel complex is primarily NFDRS Fuel Model C. Fire Behavior Fuel Model 2 is characteristic adjacent to the Middle Fork of the Salmon River and changes to a Fuel Model 9 at the upper elevations of the zone.

CRAGS ZONE - The balance of the Bighorn Crags Unit is occupied by this zone. The Crags Zone is typified by high elevation vegetation and fuel types. The lower elevations of this zone are characterized by Fire Groups Eight and Nine with Douglas-fir being a major seral component. Fire Group Eight is a collection of warm, lower subalpine habitat types which are generally dominated by Douglas-fir. Engelmann spruce may also be a major seral component. Fire Group Eight habitat types range from wet to dry. Some common shrubs in this group are white spirea, common juniper, russet

buffaloberry, mountain snowberry, blue huckleberry, Utah honeysuckle, Sitka alder, mountain maple, and mountain ash. Low to moderate intensity fires in this group generally favor Douglas-fir over the thinner barked lodgepole pine. Severe fires favor lodgepole pine if serotinous cones are present in the pre-fire stand. Large Douglas-fir often survive severe fires and provide a seed source for the new stand. Any fire will set back the invasion of spruce or subalpine fir which would otherwise dominate the stand in the absence of fire.

To a lesser degree Fire Group Nine is present at these elevations in this zone. These are generally confined to the bottomlands next to drainages. Some characteristic undergrowth shrubs in this type are prickly currant, blue huckleberry, menziesia, Labrador tea, bearberry, honeysuckle, and grouse whortleberry. Wet undergrowths in this type generally do not support surface fires but wind driven crown fires originating in adjacent stands candamage stands in this group. NFDRS Fuel Model H and Fire Behavior Fuel Model 8 represent general fuel types at these elevations.

The upper elevations in this zone are generally dominated by Fire Group Seven, cool habitat types dominated by lodgepole pine, or Fire Group Ten, the cold upper subalpine fir habitat types. The highest elevations in this unit are characterized by strongly glaciated terrain near or above timberline. This alpine type probably fits best in Fire Group Zero. These upper elevations of this unit are also best represented by NFDRS Fuel Model H and Fire Behavior Fuel Model 8.

MIDDLE FORK UNIT

UPPER MIDDLE FORK BREAKS ZONE - Fire Groups Two and Three continue to dominate this zone which is generally described as the area adjacent to the Middle Fork of the Salmon River extending up to the 6500 foot level. Douglas-fir also becomes more evident as a component of these stands. The fire ecology of the area is similar to that of the Lower Middle Fork Zones; however, the slopes are somewhat less steep. Spread rates are also high as flashy fuels continue to dominate the understory.

PISTOL CREEK - LOON CREEK ZONE - Like the other units and zones, many Fire Groups are present in this unit; however, only the most dominant fuel types will be discussed. Fire Group Four, the cool, dry Douglas-fir habitat types beyond the normal range of ponderosa pine, is quite pronounced in this zone. This Fire Group is most prevalent on the drier aspects. Forests in Fire Group Four tend to be open and regeneration is often difficult and sporadic. Undergrowth may be sparse but strongly competitive with tree seedlings following disturbance. Elk sedge and pinegrass dominate some sites, but bluebunch wheatgrass and Idaho fescue also occur. Some common shrubs are mountain snowberry, chokecherry, currant, big sagebrush, mountain mahogany, russett buffaloberry, willow, Oregon grape, rose, white spirea, common snowberry, mountain maple, and snowbrush ceanothus. Much of this area does not receive the full benefit of winter maritime influence storms from the Pacific Ocean; however, it does receive summer rain from storms originating from the Gulf of Mexico and California coast (Steele et. al. 1981). This basically dry climate with summer rain

generally decreases tree growth. The role of fire in this Fire Group is not fully understood. Severe stand replacing fires seem likely in dense stands. In other areas relatively light fuel loads, sparse undergrowth, and generally open stands also suggest a relatively long fire interval. Fire may have created and maintained open stand conditions by thinning pole sized stands and periodically removing understory seedlings. Severe stand destroying fires leave soils temporarily exposed to accelerated erosion, but serious soil effects should not be expected on most sites in this group. Fire spread rates on these types tend to be high even though the understory fuels are sparse. Fire behavior in this type tends to react similarly to a timber-grass type, therefore NFDRS Fuel Model C and Fire Behavior Fuel Model 2 have been selected to represent the fuel types in these areas.

The cooler and moister aspects in this unit support more closed canopies and more diverse vegetation. On these aspects in the eastern portion of the unit these forests are generally dominated by Douglas-fir. These stands most likely are typical of Fire Group Five. These sites are more moist than Fire Group Four and tend to support a shrub understory. Fire spread rates tend to be lower than those found in Fire Group Four. The role of fire in this type is variable. Low to moderate intensity fires would tend to open stands. Subsequent light fires would maintain these stands in a park-like condition. After long fire free intervals, stand replacement fires could occur. On these moister aspects in the western portions of this unit subalpine fir and lodgepole pine occur with greater frequency. Fire Groups Seven, Eight, Nine, and Ten are all represented on these aspects. NFDRS Fuel Model H and Fire Behavior Fuel Model 8 best represent the fuel types in these areas.

FIRE AND LAND TYPE SUMMARY

NFDRS FUEL MODEL DESCRIPTIONS

Fuel Model C - Open pine stands typify model C fuels. Perennial grasses and forbs are the primary surface fuel but there is enough needle litter and branchwood present to contribute significantly to the fuel loading. Some brush and shrubs may be present but they are of little consequence.

Fuel Model G - Fuel Model G is used for dense conifer stands where there is a heavy accumulation of litter and downed woody material. Such stands are typically overmature and may also be suffering insect, disease, wind, or ice damage--natural events that create a very heavy buildup of dead material on the forest floor. The duff and litter are deep and much of the woody material is more that 3 inches in diameter.

Fuel Model H - The short-needled conifers are represented by Fuel Model H. In contrast to Fuel Model G fuels, Fuel Model H describes a healthy stand with sparse undergrowth and a thin layer of ground fuels.

FIRE BEHAVIOR FUEL MODELS

Fuel Model 2 - Timber (Grass and Understory) - Open pine grassy understory.

Fuel Model 8 - Closed Timber Litter - Compact litter is closed, short needle conifer stands.

Fuel Model 9 - Hardwood Litter - This type is used for long needle pine litter eg. scattered ponderosa pine with litter understory.

Fuel Model 10- Timber (Litter and Understory) - Overmature conifer stands with high loadings of dead, down woody fuel, including shrub understory or conifer reproduction.

FIRE GROUPS

Fire Group 2 - Warm, dry ponderosa pine habitat types dominated by ponderosa pine with grass understory and with a sparse shrub component.

Fire Group 3 - Warm, dry Douglas-fir habitat types dominated by fire maintained stands of ponderosa pine

Fire Group 4 - Cool, dry Douglas-fir habitat types beyond the normal range of ponderosa pine.

Fire Group 5 - Cool, moist Douglas-fir habitat types with a mixed conifer component.

Fire Group 6 - Grand fir habitat types.

Fire Group 7 - Cool habitat types dominated by lodgepole pine.

Fire Group 8 - Warm, lower subalpine habitat types typically dominated by Douglas-fir.

Fire Group 9 - Moist to wet lower subalpine habitat types.

Fire Group 10- Cold, upper subalpine fir habitat types.

Table 3

Fire and Land Type Summary

PHYSIOGRAPHIC LAND TYPE	NFDRS MODEL	FIRE BEHAVIOR MODEL	FIRE GROUP
Lower River Canyon Lands	C	2 & 9	2 & 3
Upper River Canyon Lands	C	2 & 9	2, 3, 4
Rolling Basin Lands	H	8	4, 5, 8, 9
Low Relief Fluvial Lands	G & H	8 & 10	5, 6, 7, 8
Steep Volcanic Lands	H	8	4 & 7
Steep Granitic Fluvial Lands	C & H	2 & 8	7, 8, 9
Strongly Glaciated Lands	C & H	2 & 8	0, 7, 8, 9, 10

INFORM AND INVOLVE ANALYSIS

In October of 1983 the FC-RONR Wilderness Planning Team released the array of management alternatives for the wilderness for public comment. Contained within the alternative package were the Fire Management Fact and Response Sheets.

The fact sheets contained highlights of the FC-RONR Wilderness fire management situation, a summary of fire related issues and concerns, and a description of the fire management alternatives.

The fire management issues and concerns addressed in the summary were:

1. The effects of smoke from large fires on wilderness visitors, airstrips, private inholdings, outfitters and guides, and adjacent airstrips.

2. Protection from fire for private in-holdings and special use permit areas.

3. Public understanding, acceptance, and support for a prescribed fire program in the wilderness.

4. Effects of fire on wildlife and their habitat.

5. Effects of fires on fish and their habitat.

6. Reasonable provisions for visitor safety.

7. Unnaturally high fuel accumulations may exist due to past fire exclusion policies.

8. The threat to lands outside the wilderness from lightning fires that might be allowed to burn within the wilderness when burning in high rate of spread fuel types on steep slopes in some parts of the wilderness.

9. Prescribed burning from planned ignitions may play a wilderness management role in the future.

10. The wilderness may be stratified into meaningful fire management units so that site specific prescriptions safeguard life and property and avoid serious smoke impacts, while furthering wilderness resource objectives.

The response sheets asked for comments on the issues, concerns, and fire management alternatives. Two summaries of this public comment were prepared. The Fire Management Analysis Report (Patten et.al. 1984) outlined the comments of the respondents. The Fire Management Analysis Conclusion Report (Patten et.al. 1984) is an interpretation of the public comment. Both documents are included in this plan in Appendix B.

Four fire management alternatives were developed:

1. **Alternative A** - Develop prescriptions allowing unplanned ignitions from lightning fires (unplanned ignitions) to burn to achieve wilderness resource objectives. Suppress those fires that threaten life or property, or threaten to escape outside the wilderness.

2. **Alternative B** - Suppression of all fires; no prescribed fire program.

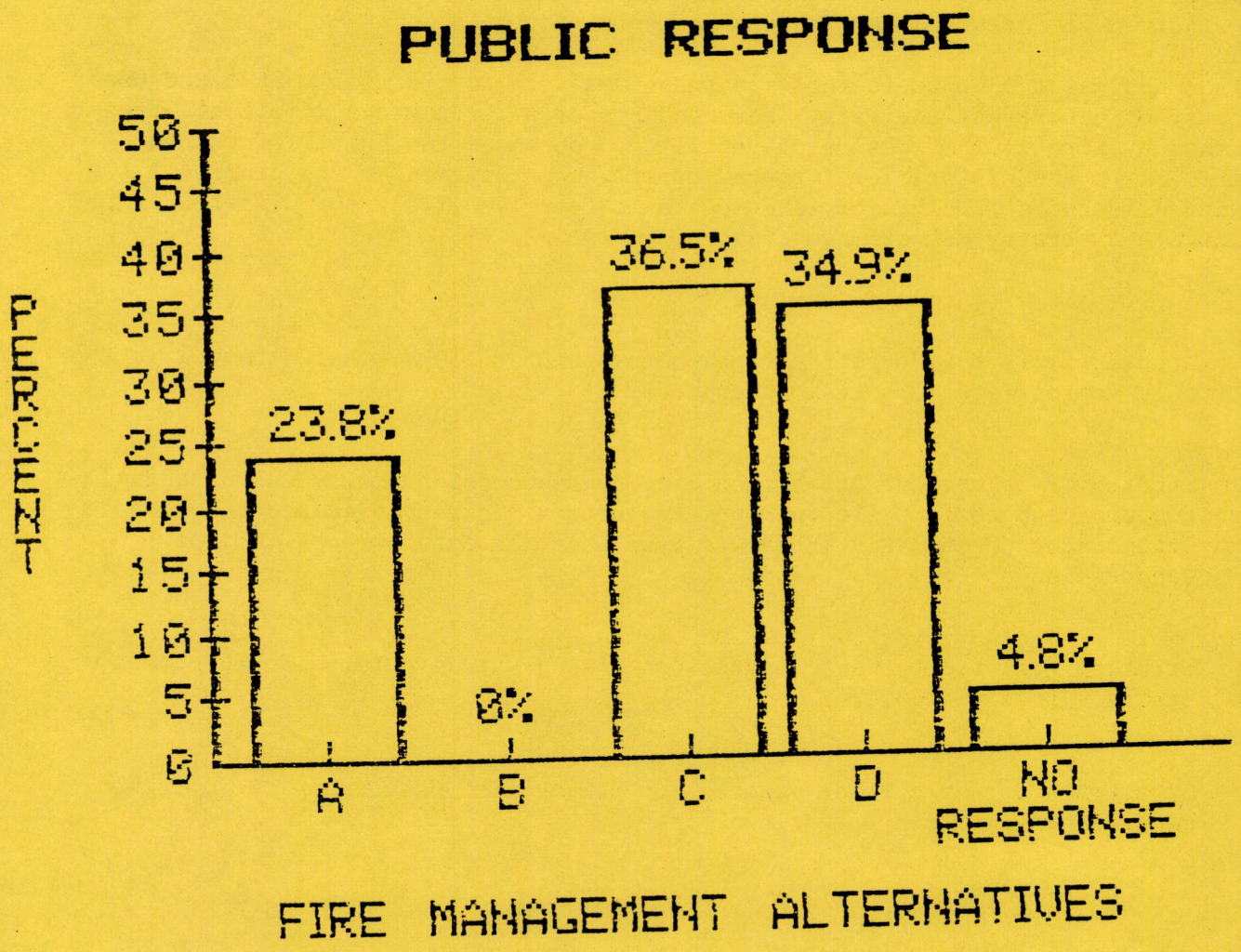
3. **Alternative C** - Develop a program for using prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objectives.

4. **Alternative D** - Develop a program emphasizing the use of prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objectives. Human-caused unplanned ignitions will be treated as natural fires when all other prescription criteria are met.

Public comment received from the response sheet questionnaire and letters favored a fire management program that included both planned and unplanned ignition prescribed fire. Figure 5 illustrates the percentage of the respondents that favored each fire management alternative. Alternatives C and D had very similar support from the respondents, however Alternative C was the selected alternative. Alternative D was considered but dropped because current fire policy does not provide for managing human-caused (unplanned) fires as prescribed fires.

Figure 5

Public Response to Fire Management Alternatives



The inform and involve is an ongoing part of this plan and a detailed Inform and Involve Plan is included in Appendix D.

ECONOMIC ANALYSIS

It is very important in a fire management plan to support the objectives with an economic analysis. The following is a summary of the Economic Analysis Frank Church - River of No Return Wilderness Fire Management Plan (Saveland 1984). This report treats cost efficiencies within the FC-RONR Wilderness and compares the relative benefits of a prescribed fire program with historical programs of fire suppression. This analysis is not intended to be a replacement for an overall economic analysis for fire management program mixes on individual Forests. This report is contained in Appendix A.

Since assigning a value to the wilderness resource is difficult, Saveland used a cost effectiveness analysis. Saveland states, "The average number of acres burned by fire is the measure of benefit. The closer the number of burned acres is to the historic or `natural condition`, the greater the benefit." Using wilderness fire history and cost data from 1960-1983 four different fire management strategies were compared.

Strategy 1 is the Forest Service policy prior to 1978, where control is the only appropriate suppression response.

Strategy 2 is the current Forest Service suppression policy where control, contain, and confine are appropriate suppression responses and the Escaped Fire Situation Analysis (EFSA) is used when the fire escapes initial suppression action.

Strategy 3 is the current suppression policy with provision for unplanned ignition prescribed fires.

Strategy 4 is the current suppression policy with provision for unplanned and planned ignition prescribed fires.

Table 4

FC-RONR Wilderness Fire Management Plan - Economic Analysis Cost Comparison

RELATIVE COST COMPARISON OF FOUR DIFFERENT FIRE MANAGEMENT STRATEGIES

	AVERAGE ANNUAL COSTS [*1] ($/YEAR)	COSTS PER ACRE [*2] ($/ACRE)	AVERAGE ANNUAL BURNED AREA (ACRES/YR.)	BURNED AREA AS A PERCENT OF TOTAL AREA PERCENT	AVERAGE ANNUAL COSTS PER BURNED ACRE ($/ACRE)
HISTORIC			23,000-47,000	1-2	
STRATEGY 1	1,951,354	0.83	4,640	0.20	421
STRATEGY 2	824,627	0.35	7,003	0.30	118
STRATEGY 3	751,181	0.32	14,532	0.62	52
STRATEGY 4	794,178	0.34	22,596	0.96	35

*1 is based on the mean number of fires per yr. during the data period 1960-83.

*2 is based on the total number of acres in the FC-RONR Wilderness.

*3 includes 5,000 acres burned each year by planned ignition at $10 per acre.

IMPACTS OF PLAN IMPLEMENTATION

POSITIVE EFFECTS OF IMPLEMENTATION - Fire suppression has not totally excluded fire effects in the FC-RONR Wilderness, but it has effectively altered them. The most significant impact of this plan will be to allow fire to play a more natural role in the wilderness, resulting in the long term fire effects being more compatible with wilderness resource objectives.

The most significant effect is the creation of vegetative diversity and the elimination of large areas of heavy fuel accumulation. These mosaics of diverse vegetation and lower fuel loadings reduce the potential for unnaturally damaging wildfires. Fuel conditions and/or types will become more separated, creating areas with pockets of dissimilar fire behavior characteristics that buffer potentially damaging effects of a fire.

Fire will become more of a driving force in the process of nutrient recycling. This will stimulate the production and maintenance of vegetation diversity within the various fire mosaics.

These conditions will enhance the establishment of a diversity of habitats capable of supporting a variety and quantity of wildlife species.

Wilderness users will be able to experience the short and long term effects created by fires burning in a natural environment.

The Economic Analysis - FC-RONR Wilderness Fire Management Plan (Saveland 1984) shows that implementation of this plan could result in significantly lower Fire Fighting Fund (FFF) expenditures.

ADVERSE EFFECTS OF IMPLEMENTATION - Implementation of this plan adds a high degree of complexity for decisions managers must make concerning wilderness fire management in the FC-RONR Wilderness.

There could be inconvenience to wilderness users from implementation of this plan, either from displacement of their wilderness activities by an active fire or visual impacts due to smoke or large burned areas.

The following impacts are mostly short term, but due to their negative effects, they can create long term consequences for wilderness fire programs:

1. Damage of loss of public or private structures.

2. Damage to private inholdings.

3. Large volumes of residual smoke causing visibility and/or potential health problems.

4. Damage or loss of resources outside the wilderness boundary caused by prescribed fires escaping from the wilderness.

5. Direct loss of revenue to commercial outfitters caused by active fires or future revenue loss from extensive fire damage to camps or special use areas.

In order to prevent these impacts, fire management prescriptions in the Action Plan contain mitigating measures which either eliminate or substantially reduce the probability of these impacts.

FIRE MANAGEMENT ACTION PLAN

INTRODUCTION

The purpose of this section of the Fire Management Plan is to provide the operational fire management prescriptions for meeting the goals and objectives outlined in the Fire Management Situation Statement (FSM 2324.02):

1. Permit lightning caused fires to play, as nearly as possible, their natural ecological role within wilderness.

2. Reduce, to an acceptable level, the risks and consequences of wildfire within wilderness or escaping from wilderness.

To facilitate planning, the Wilderness was divided into four management units as defined in the Fire Management Units section of this plan. Each of the Fire Management Units contain one to three Fire Management Zones.

1. Salmon River Unit — 416,589 Acres
   a. Cleawater Mountains Zone
   b. Salmon River Breaks Zone

2. Chamberlain Unit — 914,952 Acres
   a. Chamberlain Basin Zone
   b. Salmon River Breaks Zone
   c. Lower Middle Fork Breaks Zone

3. Big Horn Crags Unit — 176,349 Acres
   a. Crags Zone
   b. Lower Middle Fork Breaks Zone
   c. Salmon River Breaks Zone

4. Middle Fork Unit — 845,849 Acres
   a. Pistol Creek - Loon Creek Zone
   b. Upper Middle Fork Breaks Zone

FIRE PRESCRIPTION CRITERIA

The Fire Management Units were divided according to logical geographic and/or administrative boundaries. The Fire Management Zone boundaries were determined from the potential for unacceptable fire effects measured against the plan objectives. The potential is based on predicted fire behavior using fuel models, actual fire history, and fire location (geographic and/or relation to private property).

The daily Energy Release Component (ERC) is the fire weather index used as the weather parameter in the fire management prescriptions. The ERC is a fire danger index that is derived from daily weather data through the National Fire Danger Rating System. The ERC is a number related to the available energy [British Thermal Unit (Btu)] per unit area (square foot) within the flaming front at the head of a fire. The factors that go into the ERC are the volume and moisture condition of the available fuels. The ERC is dependent on loading, compaction, particle size, heat of combustion, and mineral content of the fuels. The day to day variations of the ERC are caused by changes in the moisture contents of the various fuel classes, including the fuels larger than 3 inches in diameter (1000 hour time lag class). The ERC is derived from predictions of the rate of heat release per unit area during flaming combustion, and the duration of flaming.

In the Fire Management Prescriptions the daily ERC readings are measured against curves based on percentages of the 3-day running mean of the historic high ERC. These historic means were taken from the 1970 to 1979 base period. Percentages of the actual high ERC means are used to provide a safety margin. The percentage curves for the Salmon River Breaks Zones and Middle Fork Breaks Zones are 60 percent of the high 3-day mean ERC gradually increasing to 80 percent between September 1 and September 10. The remainder of the Wilderness will use 80 percent of the high 3-day mean ERC.

The ERC is a good fuel moisture indicator. Wind does not influence the ERC. Continued high ERC values should alert the Fire Management personnel to the probability of the beginnings of drought conditions. The 80th percentile was selected as a safety margin because experience shows that fires tend to begin to make major runs and the ability to effectively control is decreased above this level.

There are six weather stations from which the ERC curves were derived and from which daily ERC will be calculated:

1. Indianola

    a. Salmon River Unit ..... Fuel Model C

    b. Crags Unit ..... Fuel Model C & H

    c. Chamberlain Unit (River Breaks Zone) ..... Fuel Model C

2. West Fork

   a. Salmon River Unit ..... Fuel Model H & G

3. Krassel

   a. Chamberlain Unit ..... Fuel Model C

   b. (Excluding the River Breaks Zone)

4. Chamberlain Basin

   a. Chamberlain Unit ..... Fuel Model H & G

5. Little Creek

   a. Middle Fork Unit ..... Fuel Model C

6. Bonanza

   a. Middle Fork Unit ..... Fuel Model H

PRESCRIPTION CONSTRAINTS

PERSON-CAUSED FIRES - Wilderness Fire Policy (FSM 2324.03) states, "Only two types of prescribed fires may be approved for use within the wilderness: those ignited by lightning and allowed to burn under prescribed conditions and those ignited by qualified Forest Service officers." Person-caused fires do not meet the above criteria and will be considered wildfires requiring an appropriate suppression response.

AVAILABILITY OF SUPPRESSION RESOURCES - This is an important assessment in the determination of whether a given fire qualifies and remains a prescribed natural fire. In the event a prescribed natural fire requires suppression action, or other action as outlined in the prescribed natural fire Burn Plan, resources from the District, Forest, or Regional level must be available. This requires constant monitoring of the National and Regional Preparedness Levels and local fire activity in order to maintain a current assessment of resource availability. Management overhead (prescribed natural fire Manager) must also be available and committed to any fire that has prescribed natural fire status.

PROTECTION OF LIFE AND PROPERTY - A primary goal of this plan is to provide for public safety and the protection of property (public and private) both inside and outside the wilderness. Fires that threaten human lives or property will require an **appropriate response.**

HUMAN LIFE - Trail portals will be signed informing visitors that they are entering a prescribed natural fire area and also of items to be aware of if they encounter a fire situation.

Further posting of portals will be necessary when there is a fire burning in the area.

Wilderness visitors should be encouraged to file a trip itinerary before entering a prescribed natural fire area so that they could be located and evacuated if fire events made this necessary.

Forest contacts for wilderness users must be kept current on prescribed **natural and/or wildfire** activities in the Wilderness, **and be provided with travel and/or use recommendations.**

If the predicted and/or current fire activity presents an **unacceptable** hazard to wilderness users, then **a legal** area, road, and/or trail closure will be put into effect.

Any time human life is endangered the fire area will be searched for people and assistance will be provided to evacuate or guide them to safety.

Any travel restrictions imposed by an administrative unit must be coordinated with adjacent units.

PROPERTY - The FC-RONR Wilderness contains 74 parcels of non-federal lands encompassing 9,944.05 acres, 114 bridges in or adjacent to the Wilderness, and 58 administrative sites. These lands and improvements require fire protection. As well as these fixed properties there are at any given time numerous camps located throughout the Wilderness containing varying amounts of personal property. This personal property has values that need to be recognized and addressed in the development of the Prescribed Natural Fire Burn Plan or EFSA.

ADMINISTRATIVE COORDINATION

COORDINATION WITH THE SELWAY-BITTERROOT AND GOSPEL-HUMP WILDERNESS FIRE MANAGEMENT PLANS - One of the primary objectives of this plan is that it be coordinated with the Selway-Bitterroot and Gospel-Hump Fire Management Plans. It is essential to the credibility of all three plans that they exhibit some degree of continuity in their design. The decision making criteria; terminology, indices, fuel models, constraints, etc.; in this plan were designed to be as compatible as possible with the other two fire plans.

The total combined acreage of the three wilderness areas is close to 4 million acres, which could create complex management problems. These problems are reduced somewhat since the Nez Perce National Forest administers the Gospel-Hump Wilderness and the portion of the FC-RONR Wilderness that borders it and, the Bitterroot National Forest administers the Selway-Bitterroot Wilderness and the adjacent portion of the FC-RONR Wilderness.

The Forests, in coordination with the Regional Offices, will be responsible to:

1. Evaluate fires with the potential to burn across wilderness boundaries and determine if they will remain in prescription when they cross the boundary.

2. Evaluate, update, and revise the three fire management plans as needed to provide more continuity and compatibility in their administration.

COORDINATION BETWEEN ADMINISTRATIVE UNITS -The Forests, and Regions administering the FC-RONR will be responsible to:

1. Utilize the established DG networking system and one to one contacts as needed to disseminate information pertaining to prescribed natural fires and wildfires. This will allow decision makers to assess the prescribed and wildfire loads at any given time, and aid in the initial stages of the prescribed natural fire assessment process by providing information necessary to evaluate the cumulative effects of a decision i.e. (smoke, unit and/or wilderness boundaries, etc.) on adjacent and/or downwind Forests or other impact areas i.e.(communities, private property, etc.). To provide continuity in reporting Wilderness fires, the following Wilderness Fire Status Report will be used for the electronic distribution of information.

WILDERNESS FIRE SITUATION REPORT

Forest:_____ Management Zone:_____

Date:_____ Time:_____

* Status: (Denote appropriate suppression response if a wildfire.)

Overview:

SO No.	Fire Name	Start Date	Location	Fuel Type	Fire Size	3 Day Potential	Status Rx./ Wild	Fire Activity/ Remarks

2. Initiate as needed and/or requested by the Wilderness Area Coordinating group.

WILDERNESS AREA COORDINATION (WAC)

Objective: Provide for the coordinated management of prescribed natural fires and/or wildfires within the Frank Church-River Of No Return Wilderness.

Scope of Responsibility: The gathering and disseminating of fire information and assisting the Forests and Regions in establishing status of new starts and, setting priorties for on-going fires for personnel, resources, etc., within the FC-RONR Wilderness.

Level of Authority: The WAC group will be implemented through the Regional Offices based on input from the Forests. The authority of the group will come from the six Forest Supervisors through a lead Forest determined at the time of call by such factors as current fire complexity, critical social, political, and/or economic considerations, etc.

Organization:

1. Wilderness Fire Coordinator.
2. Fire Information Officer.
3. Wilderness Resource Advisor assigned by Forest(s).
   a. Includes individual from each involved Forest.

Qualifications: The Wilderness Fire Coordinator, and Wilderness Liaison must be familiar with the content and prescriptive application of the Frank Church-River Of No Return Wilderness Fire Management Plan. The Wilderness Fire Coordinator must be a qualified Prescribed Fire Manager, and the Fire Information Officer and Wilderness Liaison must be familiar with the wilderness prescribed natural fire program.

Every year each of the six involved Forests will submit to the R-1, R-4 Regional Prescribed Natural Fire Coordinators a list of individual's qualified for the positions of Wilderness Fire Coordinator and Fire Information Officer.

INFORM AND INVOLVE PROCEDURES

The information and involvement program for the FC-RONR Wilderness Fire Management Plan is a key factor in the continued success of the prescribed natural fire program. This process addresses the general public (visitors, users, local communities); media; federal, state and local agencies (political & general contacts); and in-service USDA Forest Service.

The inform and involve procedures for actions to be taken before, during, and after a prescribed natural fire is declared are covered in detail in the FC-RONR Wilderness Fire Management Plan - Inform and Involve Plan (Appendix D); also included in this plan are examples of the Wilderness Fire Signs and direction for their use.

RISK & PLANNING SCENARIOS

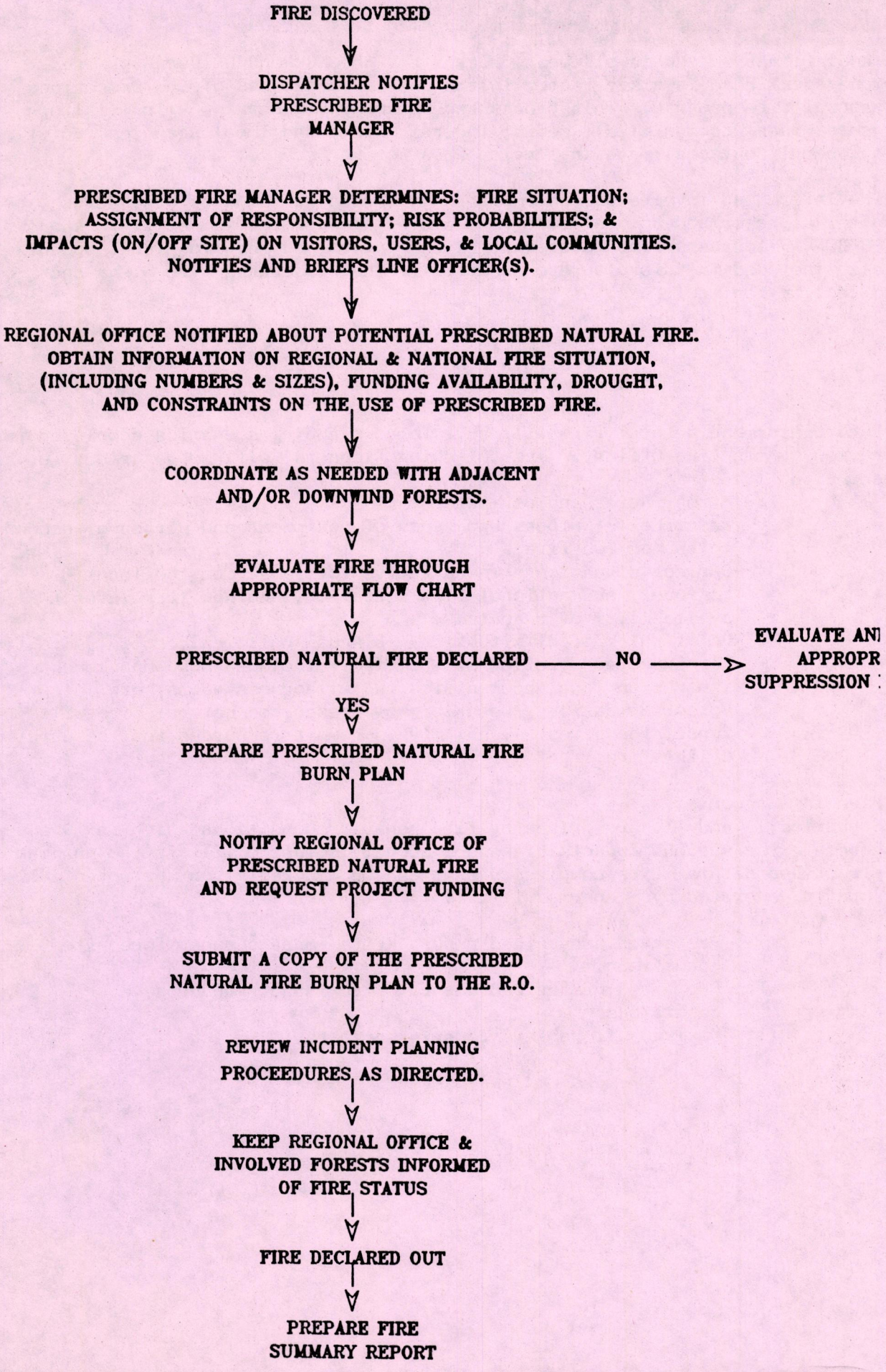
Each prescribed natural fire will have three planning scenarios completed for review by the Line Officer. The following "impacts" will be described for each scenario.

1. Size - Acres and perimeter
2. Resources - Numbers and types of equipment and personnel needed to manage the fire.
3. Current situation - In narrative form describe the local, regional, and national fire situation, and how it relates to availability of resources.
4. Political, Social situation - Discuss political, social situation for expected duration of the fire. Include smoke management, impacts on local communities and wilderness users, etc.
5. Forest Situation - Describe how prescribed natural fire will impact the Forest's, ability to commit resources for the duration of the fire.

Planning Scenarios:
Scenarios I. and II. are driven by fire behavior conditions which in turn generate the various impacts discussed above. Scenario III. is the maximum prescribed natural fire complexity that can be managed given the potential impacts generated by Scenarios I. & II.

I. Projected prescribed natural fire impacts under forecasted conditions.
II. Projected prescribed natural fire impacts under severe conditions.
III. Maximum allowable fire size/perimeter

DECISION MAKING & NOTIFICATION FLOW CHART


FIRE DISCOVERED
DISPATCHER NOTIFIES PRESCRIBED FIRE MANAGER
PRESCRIBED FIRE MANAGER DETERMINES: FIRE SITUATION; ASSIGNMENT OF RESPONSIBILITY; RISK PROBABILITIES; & IMPACTS (ON/OFF SITE) ON VISITORS, USERS, & LOCAL COMMUNITIES. NOTIFIES AND BRIEFS LINE OFFICER(S).
REGIONAL OFFICE NOTIFIED ABOUT POTENTIAL PRESCRIBED NATURAL FIRE. OBTAIN INFORMATION ON REGIONAL & NATIONAL FIRE SITUATION, (INCLUDING NUMBERS & SIZES), FUNDING AVAILABILITY, DROUGHT, AND CONSTRAINTS ON THE USE OF PRESCRIBED FIRE.
COORDINATE AS NEEDED WITH ADJACENT AND/OR DOWNWIND FORESTS.
EVALUATE FIRE THROUGH APPROPRIATE FLOW CHART
PRESCRIBED NATURAL FIRE DECLARED
NO
EVALUATE AN APPROPR SUPPRESSION
YES
PREPARE PRESCRIBED NATURAL FIRE BURN PLAN
NOTIFY REGIONAL OFFICE OF PRESCRIBED NATURAL FIRE AND REQUEST PROJECT FUNDING
SUBMIT A COPY OF THE PRESCRIBED NATURAL FIRE BURN PLAN TO THE R.O.
REVIEW INCIDENT PLANNING PROCEEDURES AS DIRECTED.
KEEP REGIONAL OFFICE & INVOLVED FORESTS INFORMED OF FIRE STATUS
FIRE DECLARED OUT
PREPARE FIRE SUMMARY REPORT

FIRE MONITORING AND ASSIGNMENT OF RESPONSIBILITY

The purpose of Fire Monitoring is to gather and/or observe fire information to utilize in daily evaluation of prescribed natural fires. Information is assembled from both on and off site to help managers assess the total fire and smoke situation. This evaluation aids managers in decisions concerning new ignitions and active prescribed natural fires. All prescribed natural fire monitoring activities will be documented in the Fire Observation Report (Appendix F).

MONITORING SITUATIONS - The following table illustrates differences in fire parameters affecting various monitoring situations.

Table 5

Monitoring Situations

FIRE SITUATION COMPLEXITIES WHICH INFLUENCE STANDARDS FOR FIRE MONITORING

SITUATION PARAMETERS	SITUATION I	SITUATION II	SITUATION III
AIR QUALITY	Local on-site effects only	Significant on site effects and some off-site impacts	Significant on and off site impacts
BOUNDARY FIRES	No existing or potential threat to unit or zone boundaries	Potential threat to unit or zone boundaries	Serious or imminent threat to unit or zone boundaries
LIFE/PROPERTY ENDANGERED BY FIRE OR SMOKE	No threat	Potential threat to property	Potential threat to life and property
FIRE BEHAVIOR INDICATORS			
1. BURNING INDEX	0-38	39-78	>78
2. FIRELINE INTENSITY	0-99 BTU/S/FT	100-499 BTU/S/FT	>500 BTU/S/FT
3. FLAME LENGTH	0-3.8 FT	3.9-7.8 FT	>7.8 FT
4. FIRE SPREAD	<10 AC/DAY	10-100 AC/DAY	>100 AC/DAY
5. ERC (THREE DAY MEAN)	<80%	>80%	>80%
6. PALMER DROUGHT INDEX	MODERATE	HIGH	EXTREME

QUALIFICATIONS AND PROCEDURES - Each prescribed natural fire will require a qualified Prescribed Fire Manager (as defined in FSM 5140) to manage it. The monitoring frequency for a prescribed natural fire is determined by the Fire Situation Level. Since it is unlikely that all the fire parameters will match up under a given fire situation, the highest individual parameter situation will dictate the necessary monitoring frequency.

Table 6

Fire Monitoring Qualifications and Procedures:

	FIRE SITUATION LEVEL I	FIRE SITUATION LEVEL II	FIRE SITUATION LEVEL III
MONITORING REQUIREMENTS	Prescribed Fire Manager	Prescribed Fire Manager	Prescribed Fire Manager
MONITORING FREQUENCY	As needed with routine air patrols	Daily Patrol Flights	Daily Flights and/or ground monitoring teams

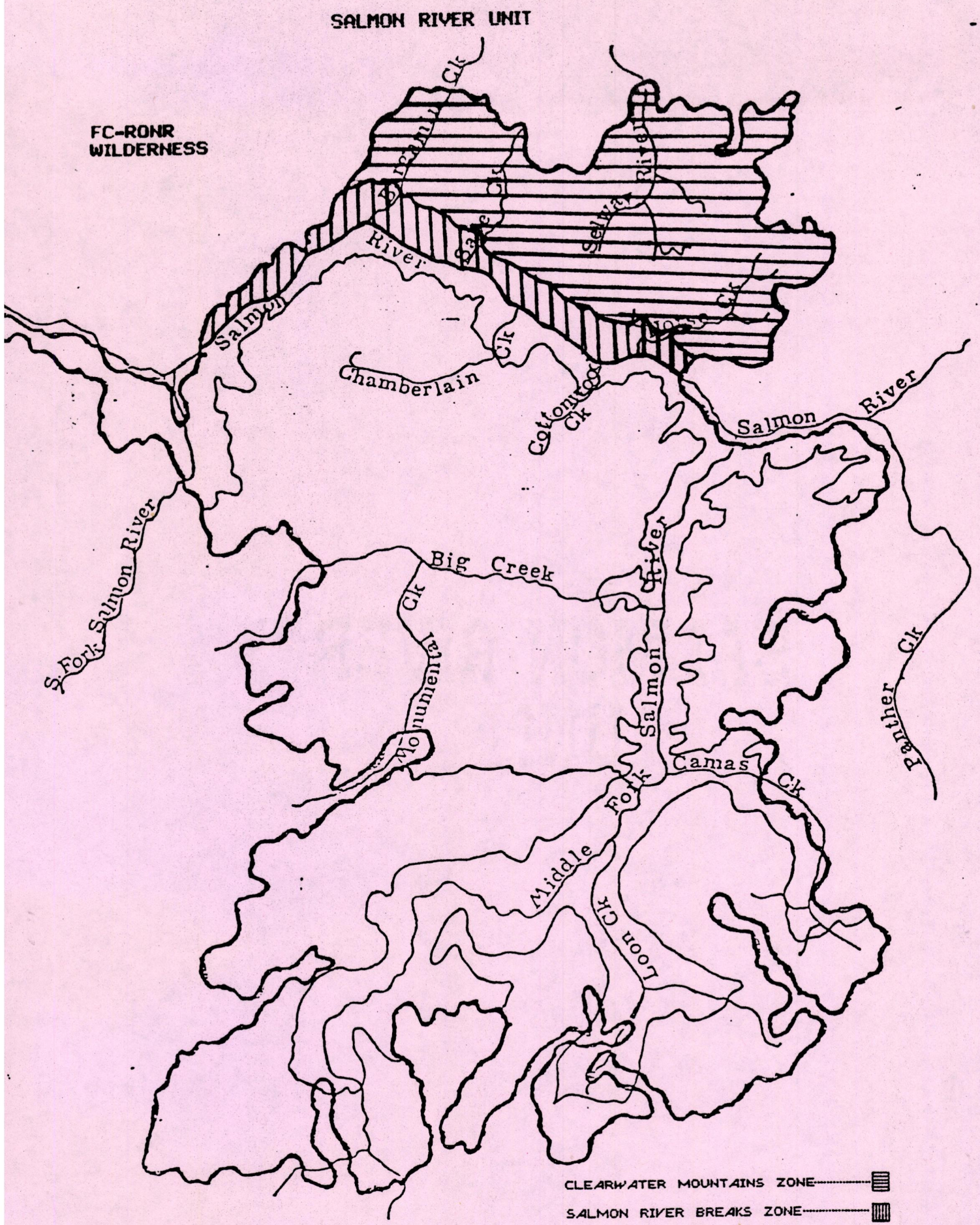
INITIAL AND SUBSEQUENT DECISION RESPONSIBILITY - Assignment of responsibility and support needs to an incident, like monitoring, are dependent upon the highest Fire Situation Level as determined from the monitoring parameters table.

Table 7

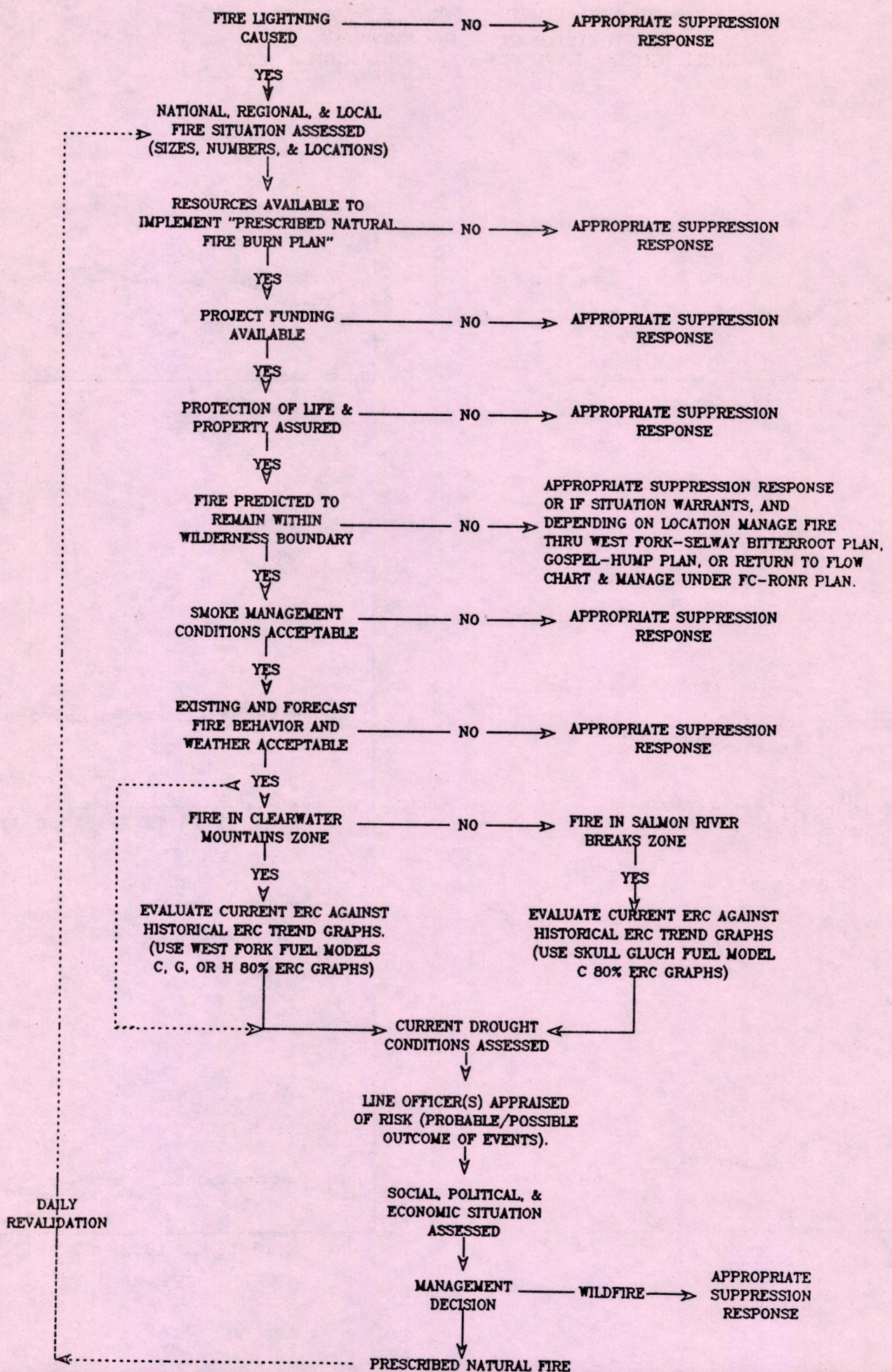
Assignment of Responsibility and Support

	FIRE SITUATION LEVEL I	FIRE SITUATION LEVEL II	FIRE SITUATION LEVEL III
RESPONSIBILITY	District Ranger	Forest Supervisor	Forest Supervisor
SUPPORT	Prescribed Fire Manager	Prescribed Fire Manager	Evaluation Team and /or WAC Team

SALMON RIVER UNIT


SALMON RIVER UNIT
FC-RONR WILDERNESS
Salmon River
Chamberlain Ck
Cottonwood Ck
Salmon River
S. Fork Salmon River
Big Creek
Monumental Ck
Salmon River
Panther Ck
Camas Ck
Middle Fork
Loon Ck
CLEARWATER MOUNTAINS ZONE
SALMON RIVER BREAKS ZONE

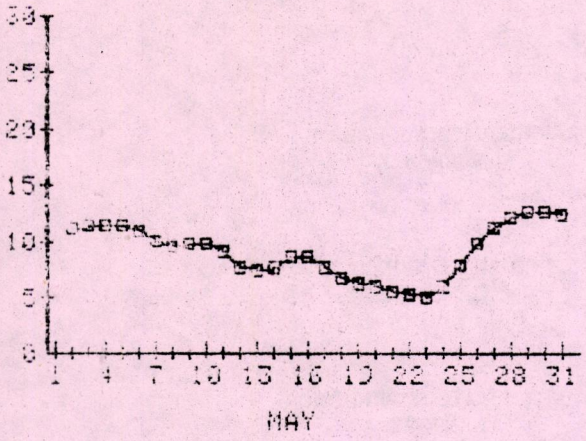
SALMON RIVER UNIT


FIRE LIGHTNING CAUSED
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
NATIONAL, REGIONAL, & LOCAL FIRE SITUATION ASSESSED (SIZES, NUMBERS, & LOCATIONS)
RESOURCES AVAILABLE TO IMPLEMENT "PRESCRIBED NATURAL FIRE BURN PLAN"
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
PROJECT FUNDING AVAILABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
PROTECTION OF LIFE & PROPERTY ASSURED
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
FIRE PREDICTED TO REMAIN WITHIN WILDERNESS BOUNDARY
NO
APPROPRIATE SUPPRESSION RESPONSE OR IF SITUATION WARRANTS, AND DEPENDING ON LOCATION MANAGE FIRE THRU WEST FORK-SELWAY BITTERROOT PLAN, GOSPEL-HUMP PLAN, OR RETURN TO FLOW CHART & MANAGE UNDER FC-RONR PLAN.
YES
SMOKE MANAGEMENT CONDITIONS ACCEPTABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
EXISTING AND FORECAST FIRE BEHAVIOR AND WEATHER ACCEPTABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
FIRE IN CLEARWATER MOUNTAINS ZONE
NO
FIRE IN SALMON RIVER BREAKS ZONE
YES
EVALUATE CURRENT ERC AGAINST HISTORICAL ERC TREND GRAPHS. (USE WEST FORK FUEL MODELS C, G, OR H 80% ERC GRAPHS)
YES
EVALUATE CURRENT ERC AGAINST HISTORICAL ERC TREND GRAPHS (USE SKULL GLUCH FUEL MODEL C 80% ERC GRAPHS)
CURRENT DROUGHT CONDITIONS ASSESSED
LINE OFFICER(S) APPRAISED OF RISK (PROBABLE/POSSIBLE OUTCOME OF EVENTS).
SOCIAL, POLITICAL, & ECONOMIC SITUATION ASSESSED
MANAGEMENT DECISION
WILDFIRE
APPROPRIATE SUPPRESSION RESPONSE
PRESCRIBED NATURAL FIRE
DAILY REVALIDATION

SALMON RIVER BREAKS ZONE

HISTORIC ERC TREND GRAPHS

SKULL GULCH C4P2 80% OF MEAN HIGH ERC'S



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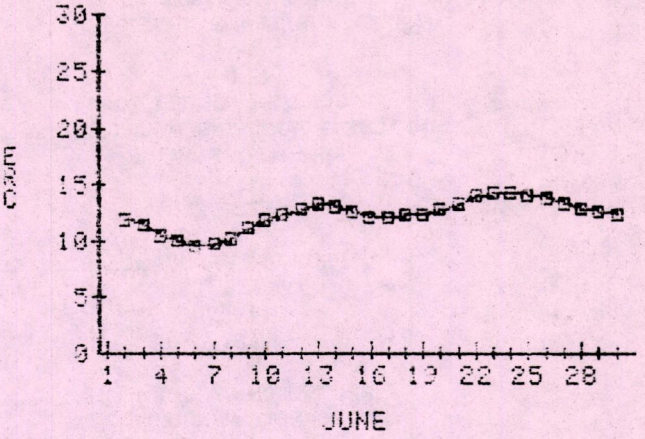
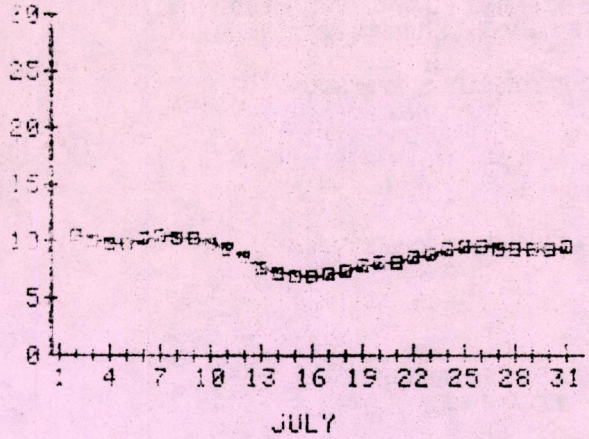


JUNE



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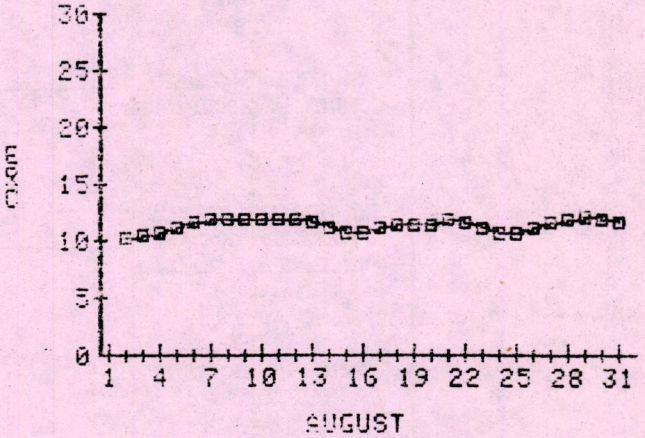
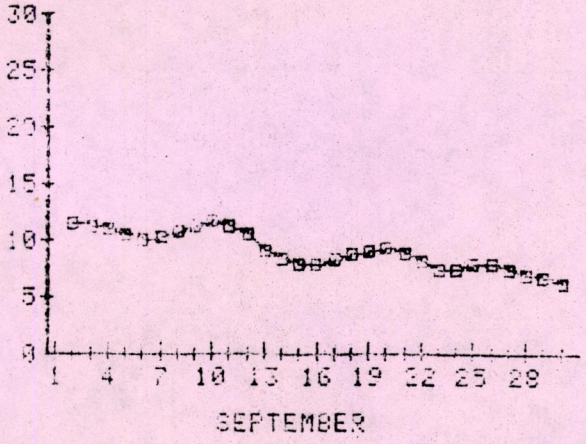
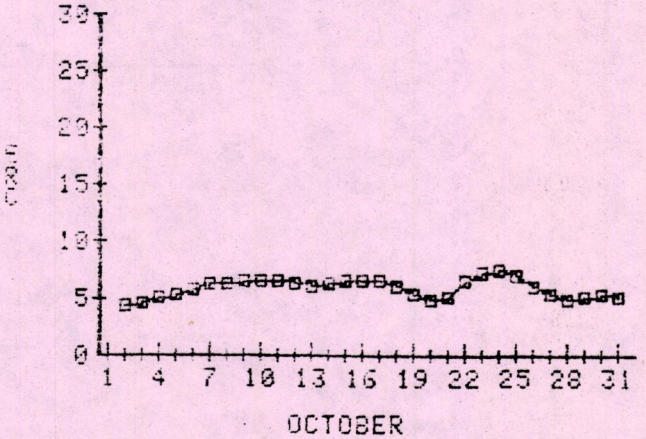


AUGUST

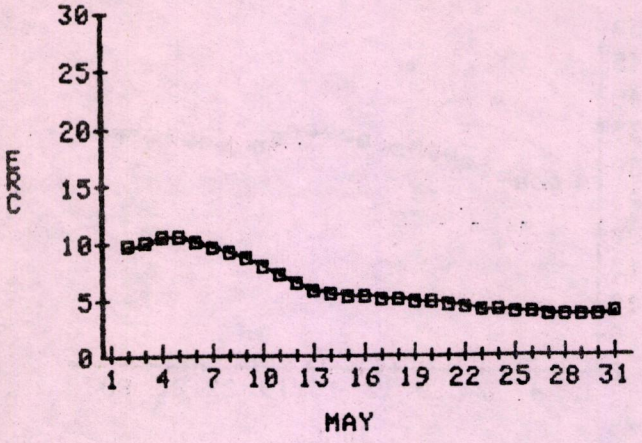


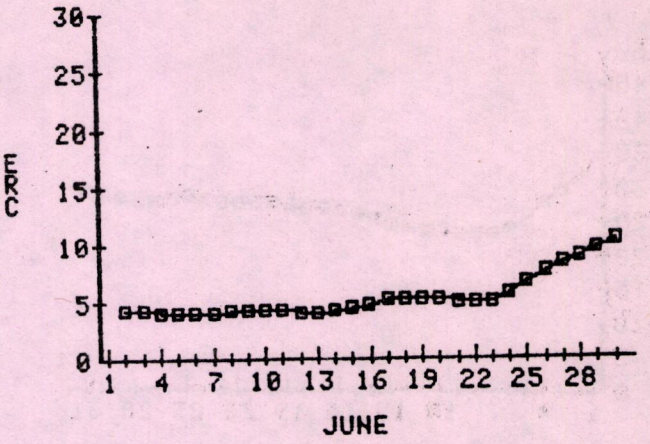
SEPTEMBER

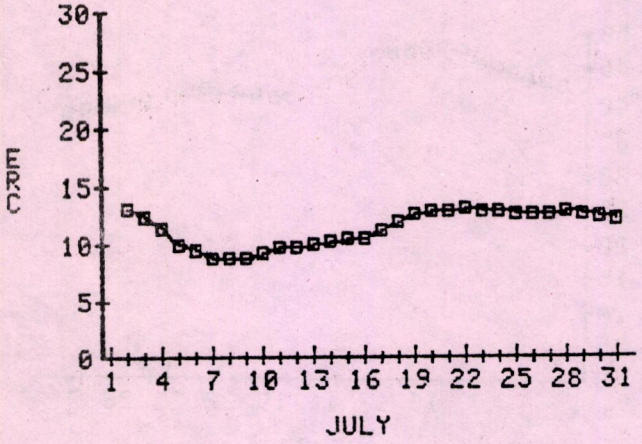


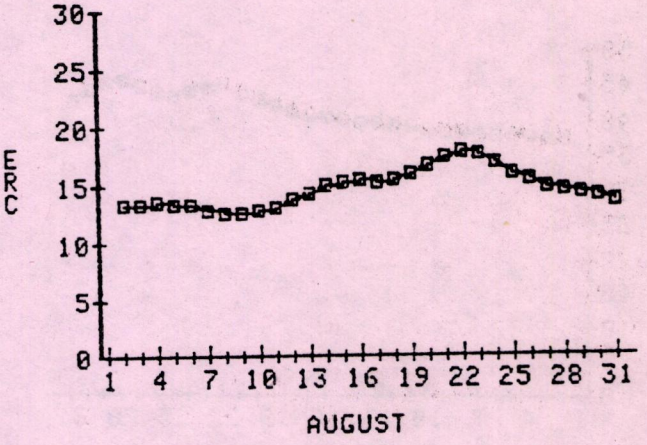
OCTOBER

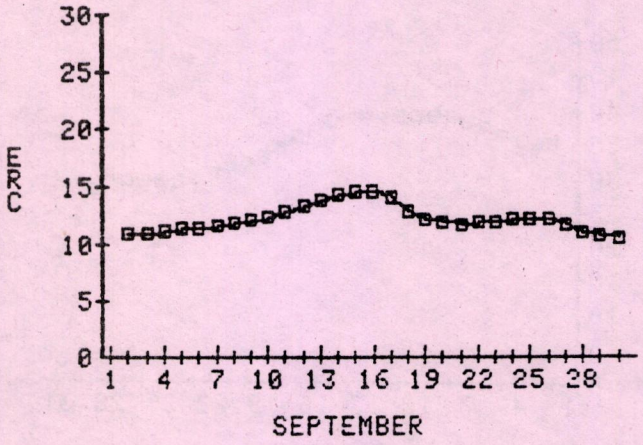
CLEARWATER MOUNTAINS ZONE
HISTORIC ERC TREND GRAPHS
WEST FORK C4P3, 80% OF MEAN HIGH ERC'S

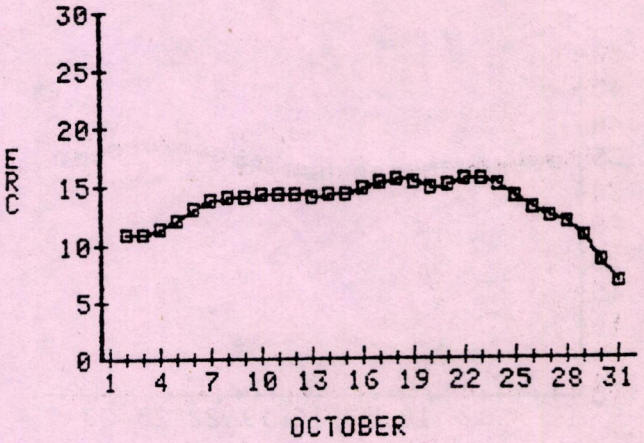




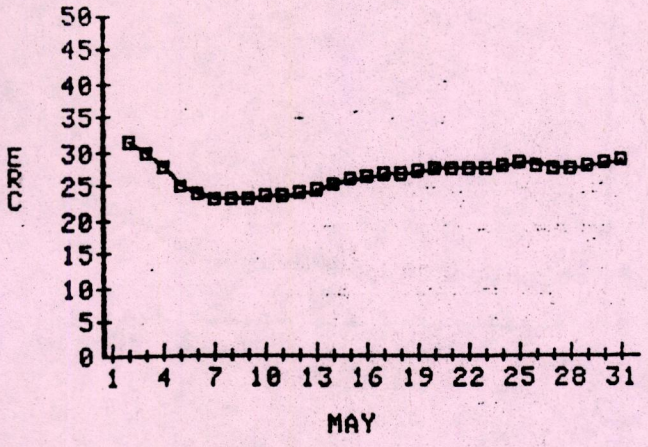








CLEARWATER MOUNTAINS ZONE
HISTORIC ERC TREND GRAPHS
WEST FORK G4P3, 80% OF MEAN HIGH ERC'S



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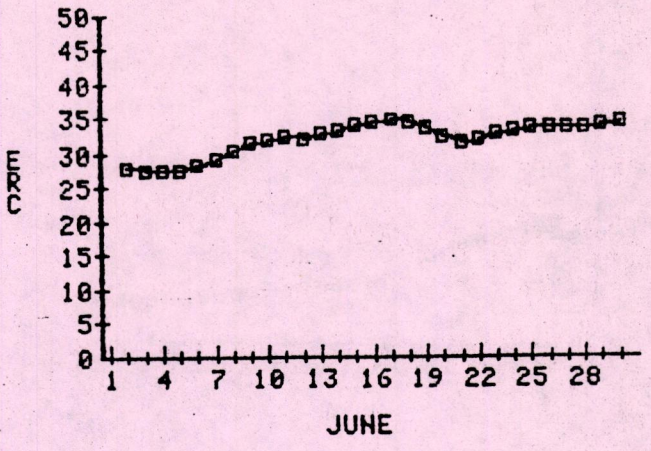

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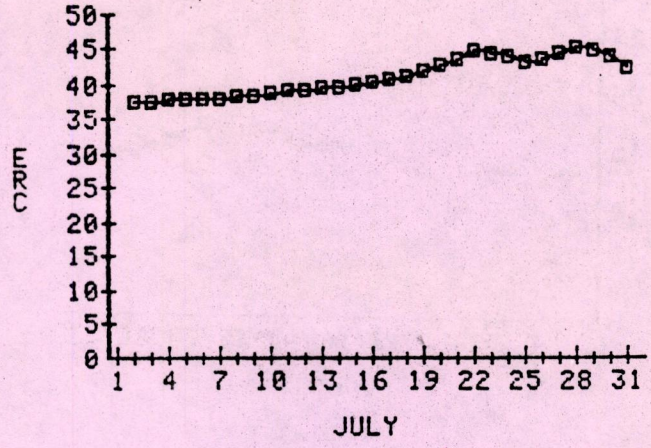

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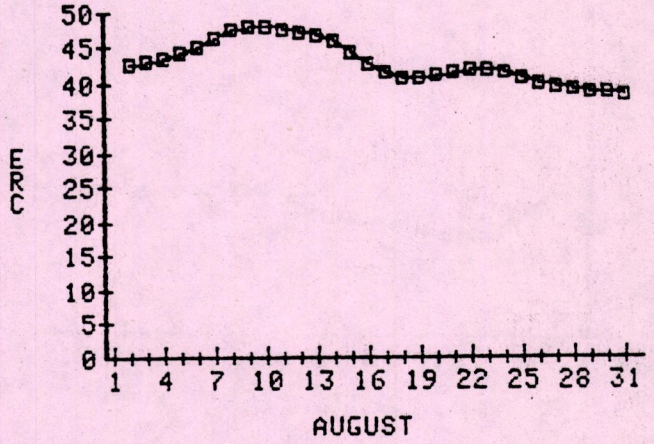

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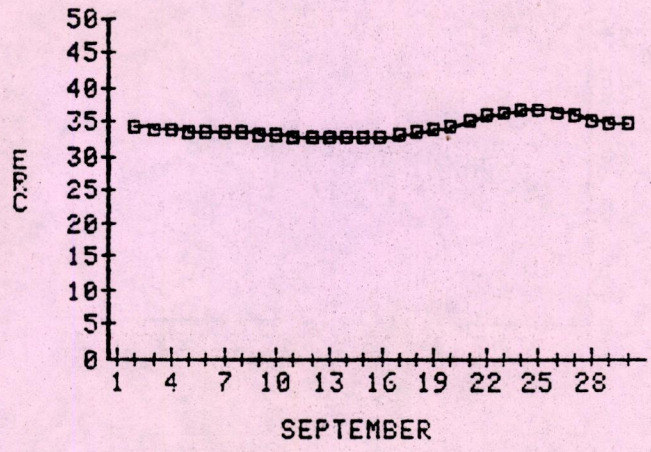

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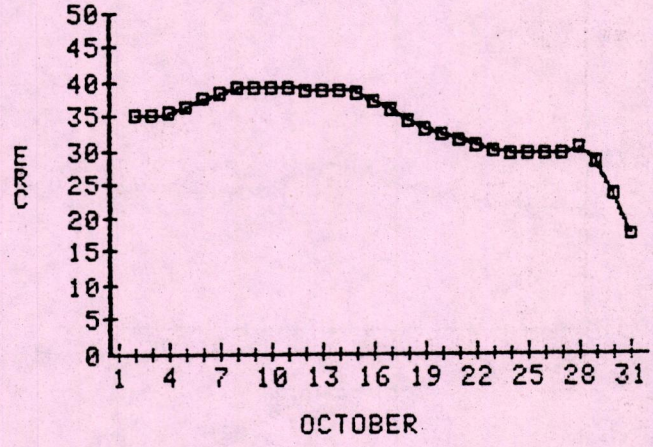
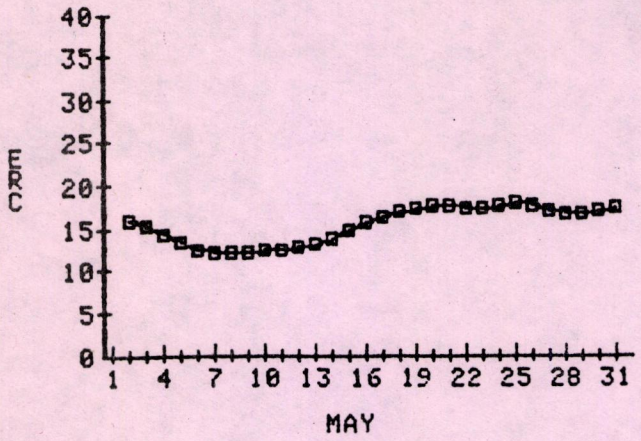
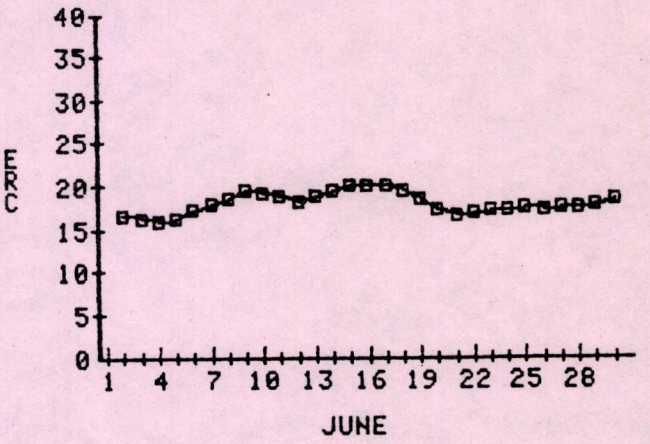
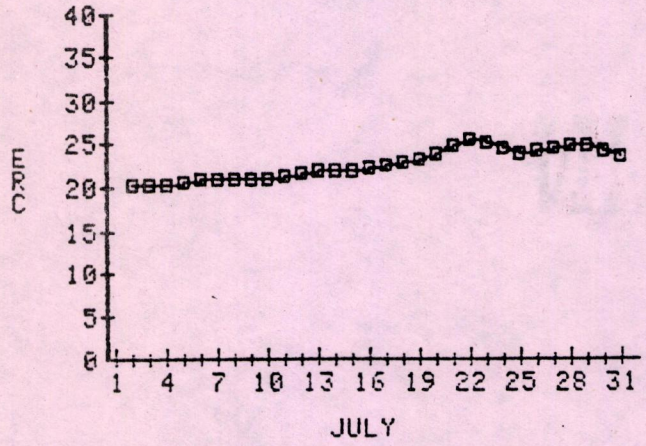


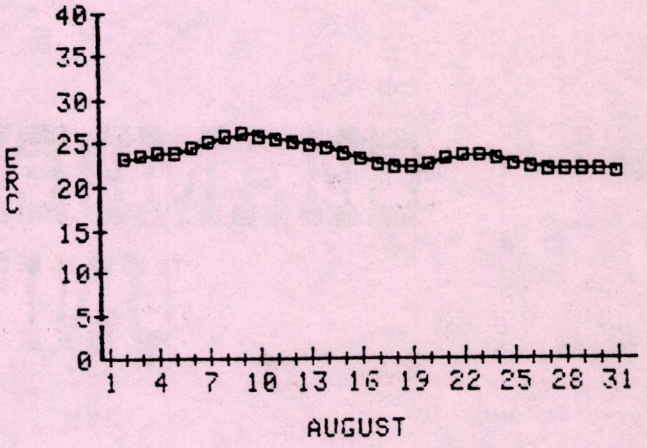
OCTOBER

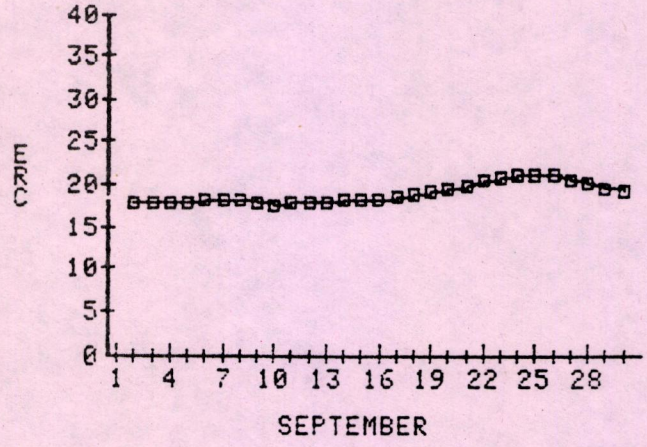
CLEARWATER MOUNTAINS ZONE
HISTORIC ERC TREND GRAPHS
WEST FORK H4P3, 80% OF MEAN HIGH ERC'S

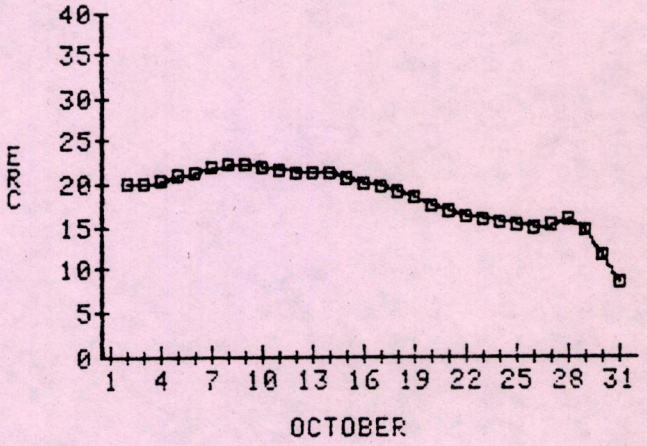




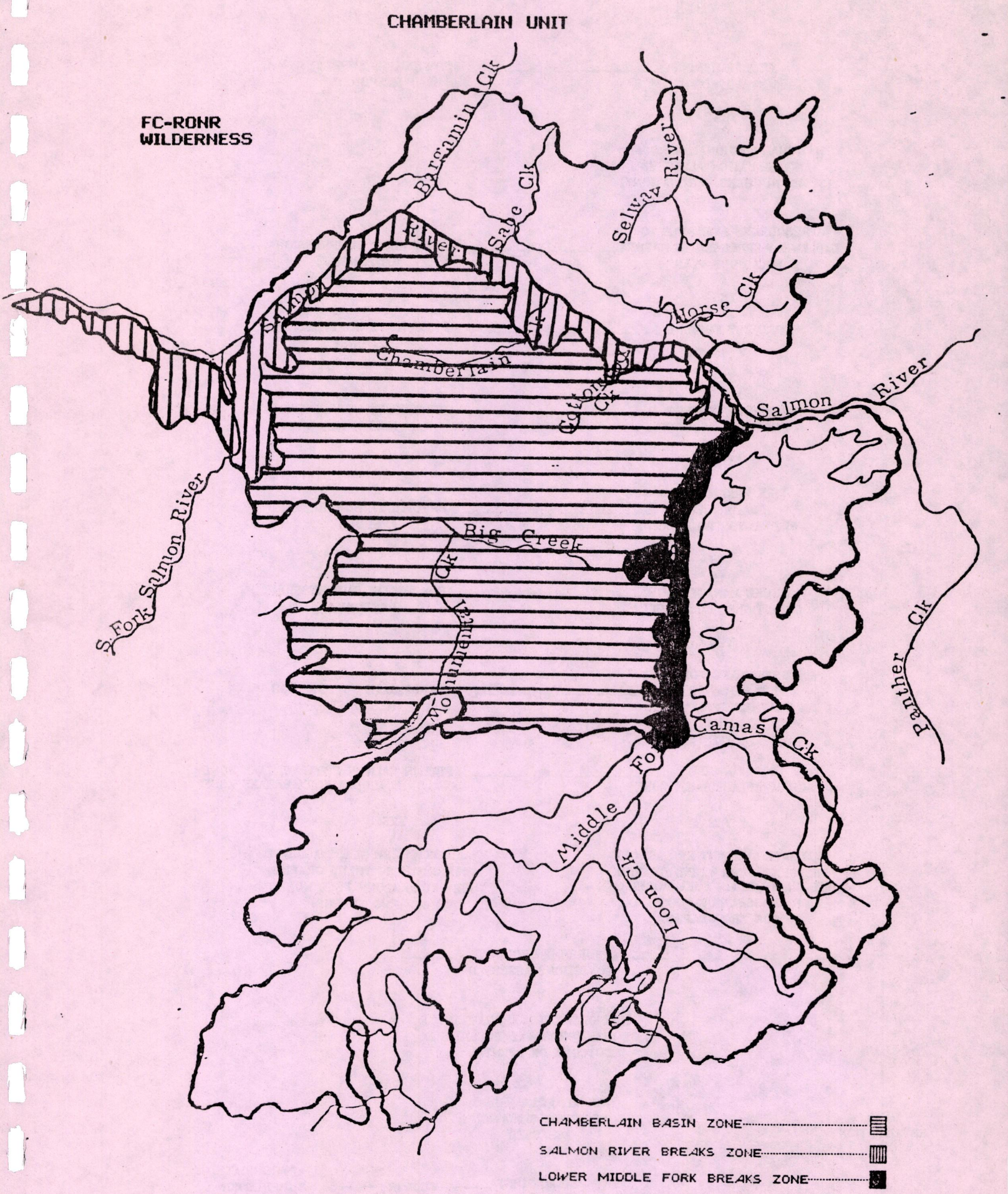




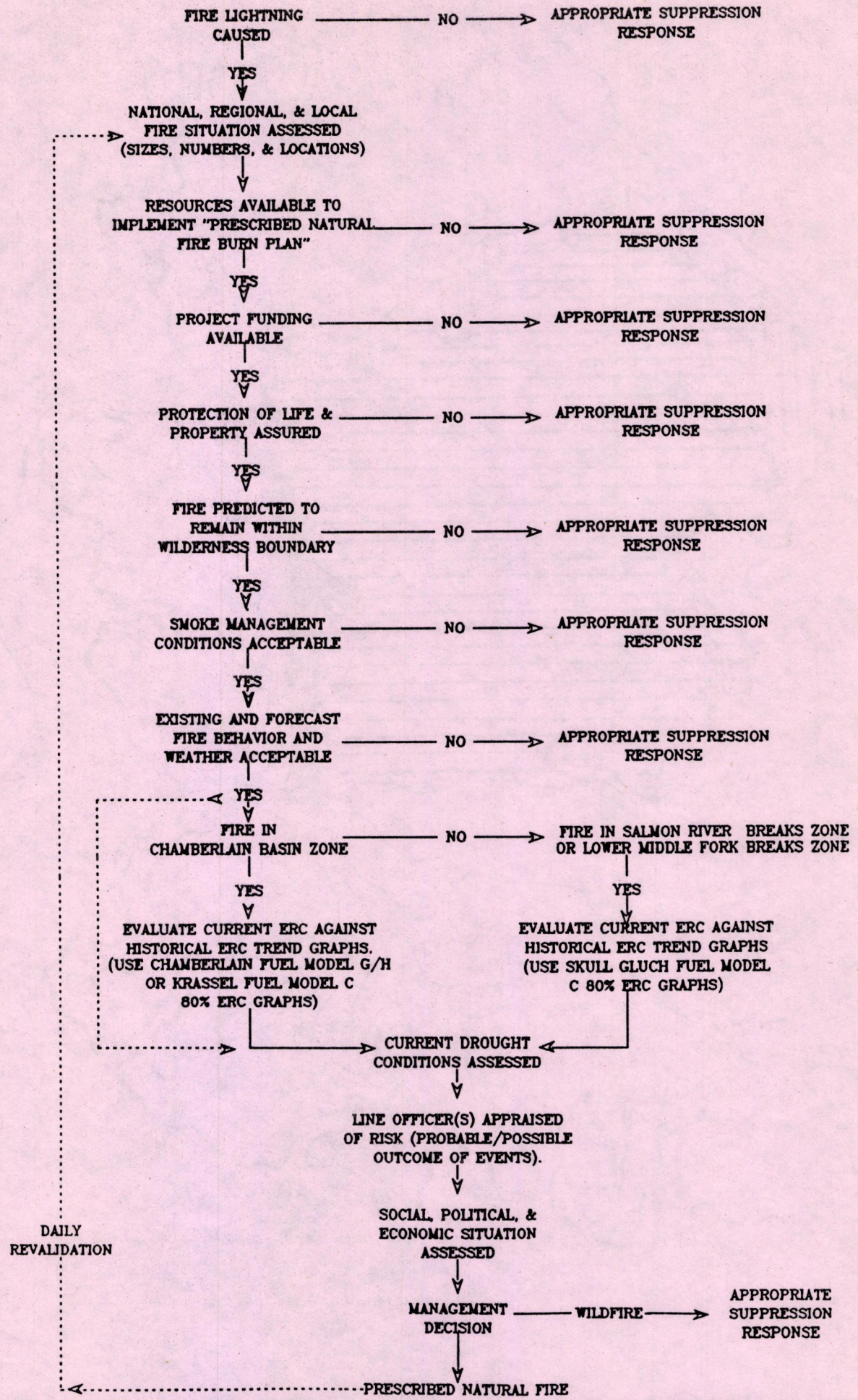




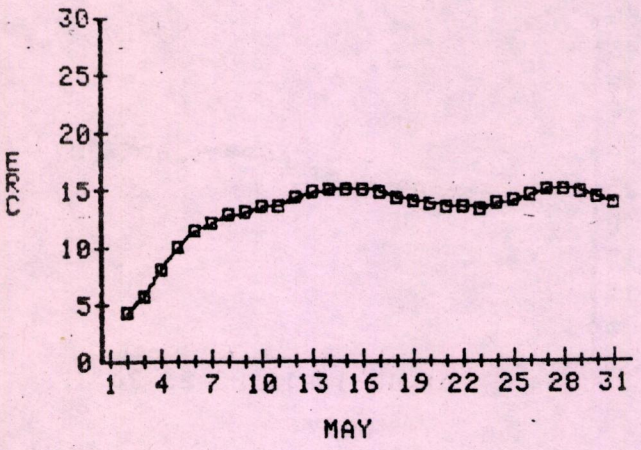
CHAMBERLAIN UNIT

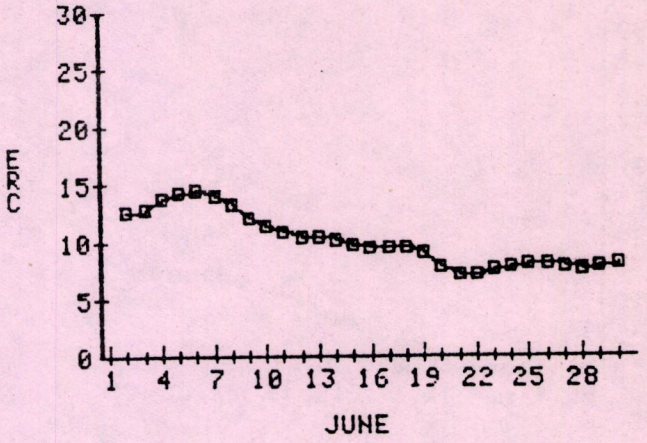

CHAMBERLAIN UNIT
FC-RONR
WILDERNESS
Bargamin Clk
Sabe Clk
Selway River
Horse Clk
Chamberlain
Gedney Clk
Salmon River
S. Fork Salmon River
Big Creek
Monumental Clk
Camas Clk
Panther Clk
Middle Fo
Loon Clk
CHAMBERLAIN BASIN ZONE
SALMON RIVER BREAKS ZONE
LOWER MIDDLE FORK BREAKS ZONE

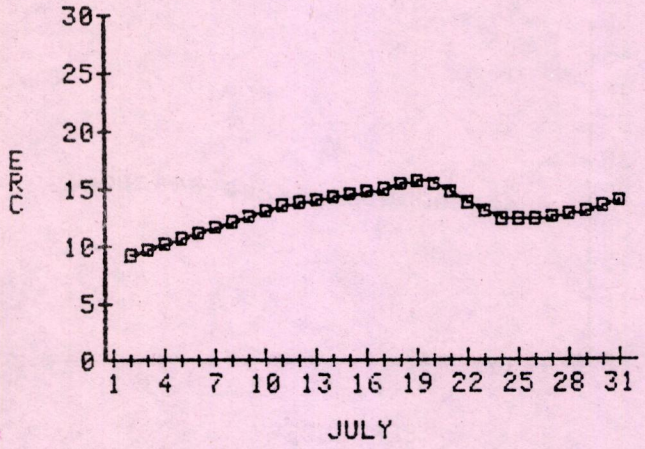
CHAMBERLAIN UNIT

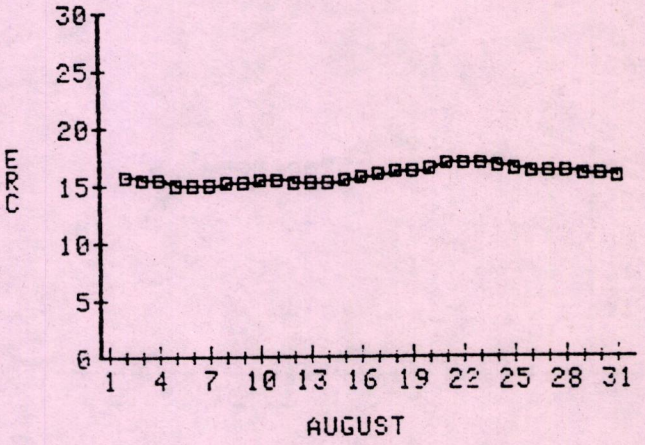

FIRE LIGHTNING CAUSED
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
NATIONAL, REGIONAL, & LOCAL FIRE SITUATION ASSESSED (SIZES, NUMBERS, & LOCATIONS)
RESOURCES AVAILABLE TO IMPLEMENT "PRESCRIBED NATURAL FIRE BURN PLAN"
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
PROJECT FUNDING AVAILABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
PROTECTION OF LIFE & PROPERTY ASSURED
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
FIRE PREDICTED TO REMAIN WITHIN WILDERNESS BOUNDARY
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
SMOKE MANAGEMENT CONDITIONS ACCEPTABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
EXISTING AND FORECAST FIRE BEHAVIOR AND WEATHER ACCEPTABLE
NO
APPROPRIATE SUPPRESSION RESPONSE
YES
FIRE IN CHAMBERLAIN BASIN ZONE
NO
FIRE IN SALMON RIVER BREAKS ZONE OR LOWER MIDDLE FORK BREAKS ZONE
YES
EVALUATE CURRENT ERC AGAINST HISTORICAL ERC TREND GRAPHS. (USE CHAMBERLAIN FUEL MODEL G/H OR KRASSEL FUEL MODEL C 80% ERC GRAPHS)
YES
EVALUATE CURRENT ERC AGAINST HISTORICAL ERC TREND GRAPHS (USE SKULL GLUCH FUEL MODEL C 80% ERC GRAPHS)
CURRENT DROUGHT CONDITIONS ASSESSED
LINE OFFICER(S) APPRAISED OF RISK (PROBABLE/POSSIBLE OUTCOME OF EVENTS).
SOCIAL, POLITICAL, & ECONOMIC SITUATION ASSESSED
MANAGEMENT DECISION
WILDFIRE
APPROPRIATE SUPPRESSION RESPONSE
PRESCRIBED NATURAL FIRE
DAILY REVALIDATION

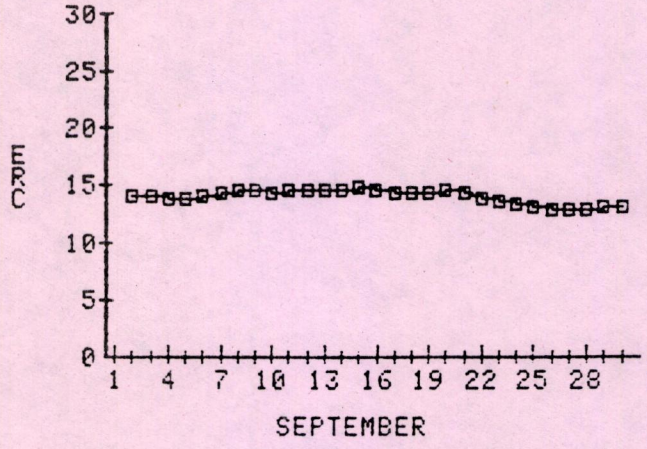
CHAMBERLAIN BASIN ZONE
HISTORIC ERC TREND GRAPHS
KRASSEL C5P2, 80% OF MEAN HIGH ERC'S

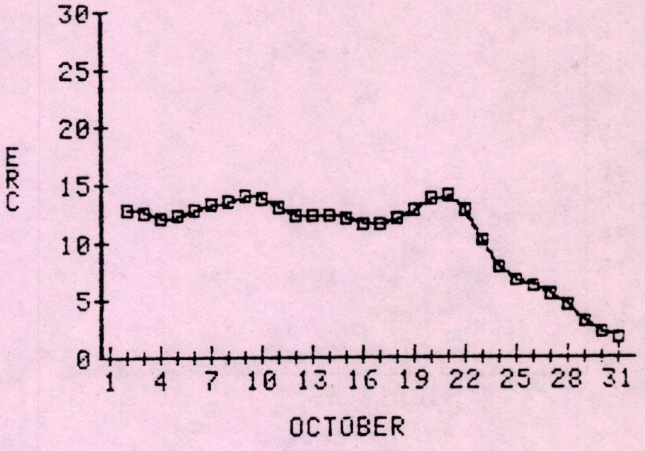




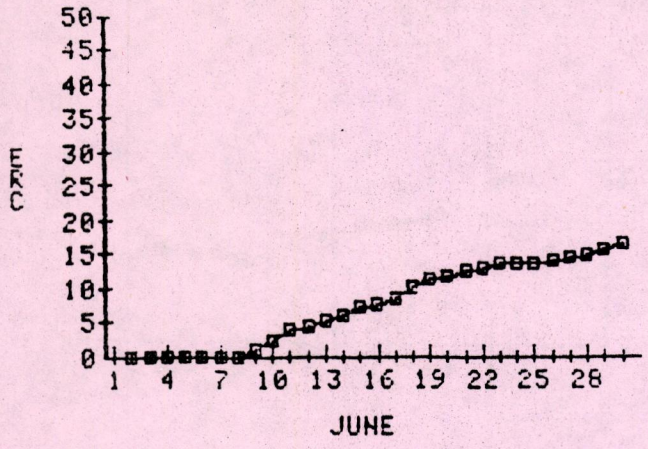








CHAMBERLAIN BASIN ZONE
HISTORIC ERC TREND GRAPHS
CHAMBERLAIN G3P3, 80% OF MEAN HIGH ERC'S



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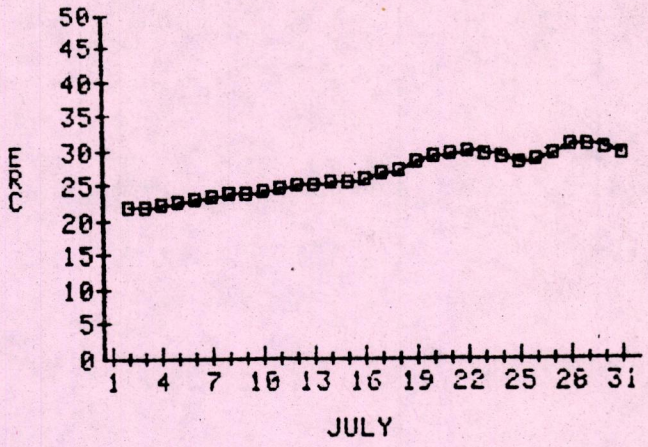

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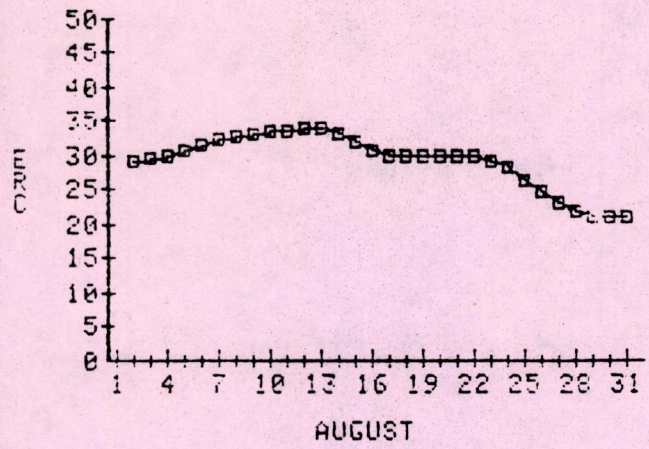
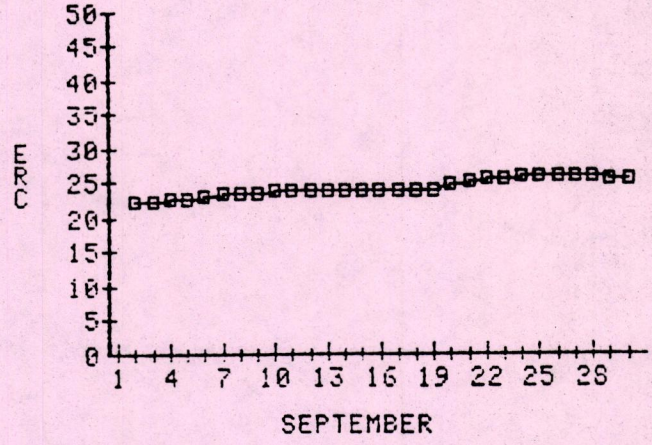
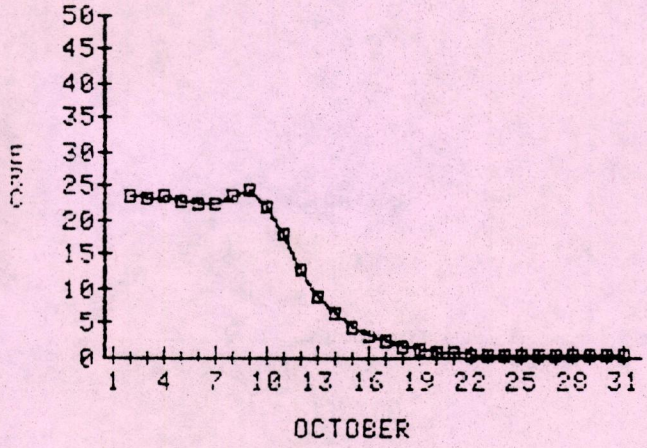


AUGUST

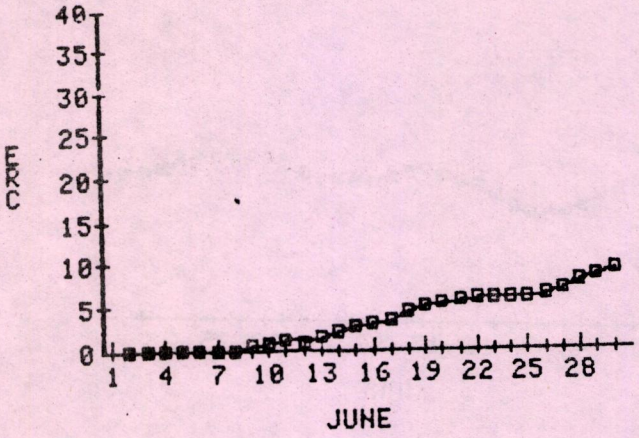


SEPTEMBER



OCTOBER

CHAMBERLAIN BASIN ZONE
HISTORIC ERC TREND GRAPHS
CHAMBERLAIN H3P3, 80% OF MEAN HIGH ERC'S



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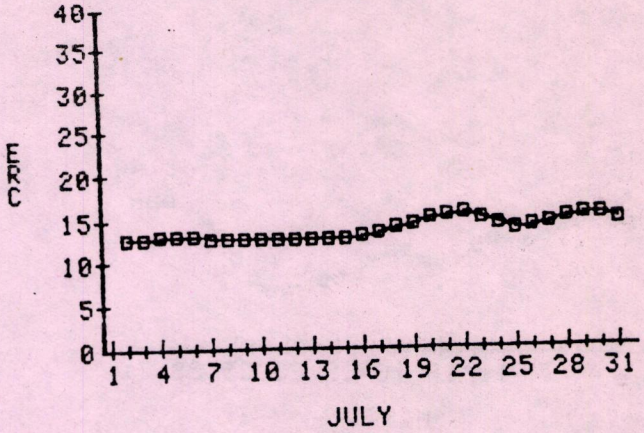

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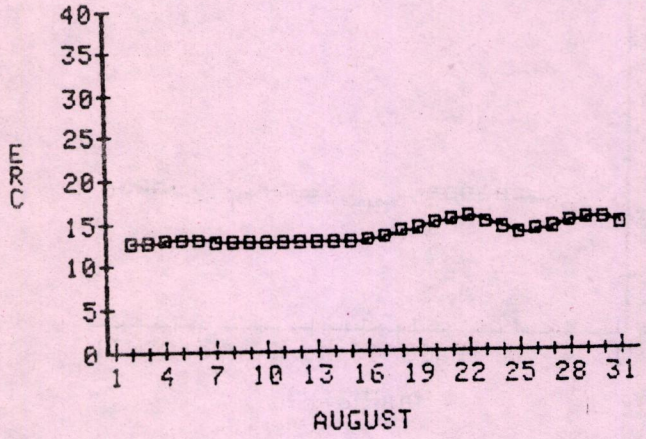
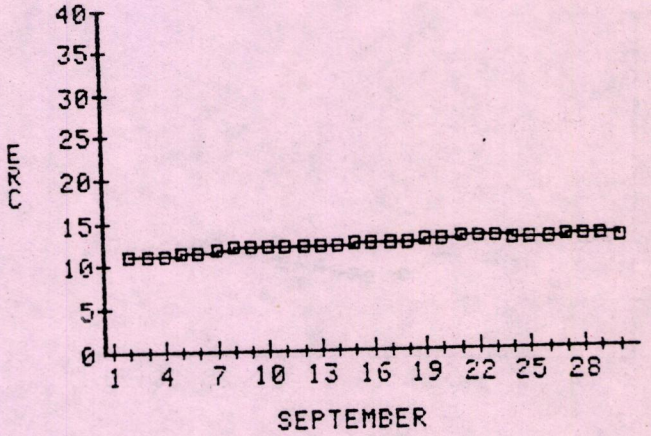


AUGUST



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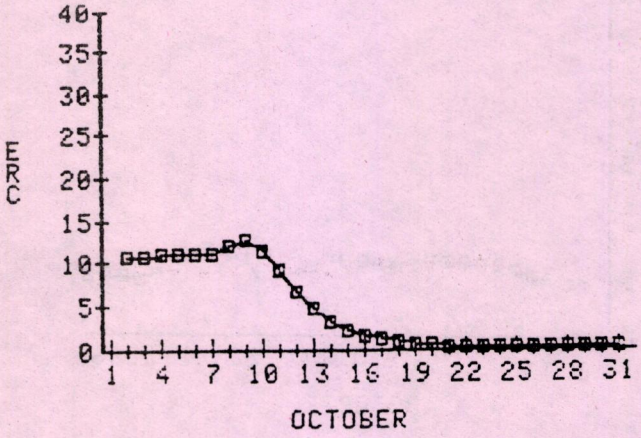
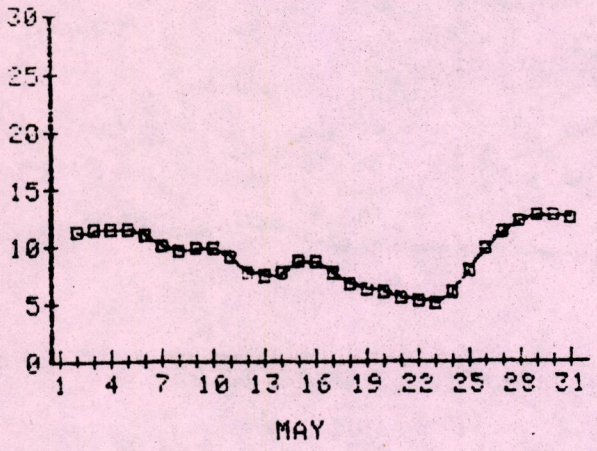
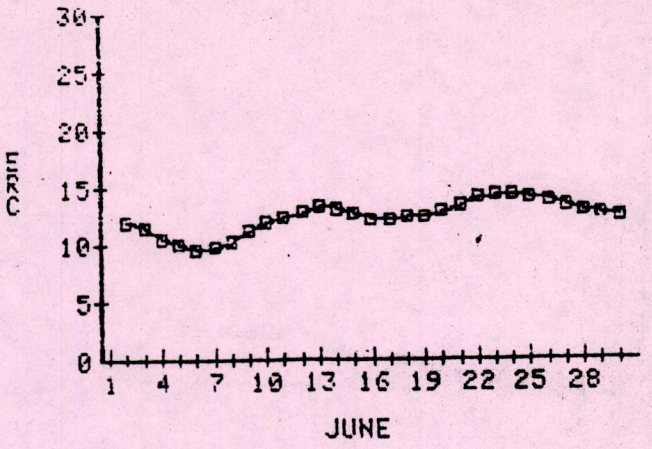
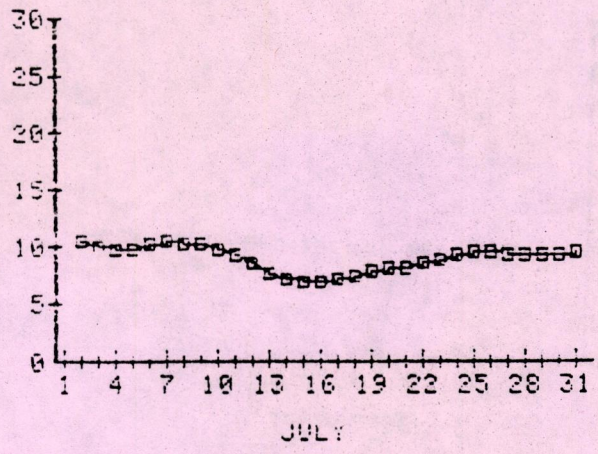


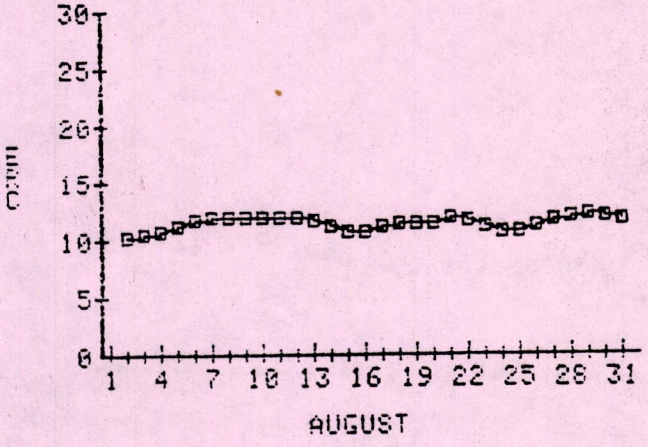
OCTOBER

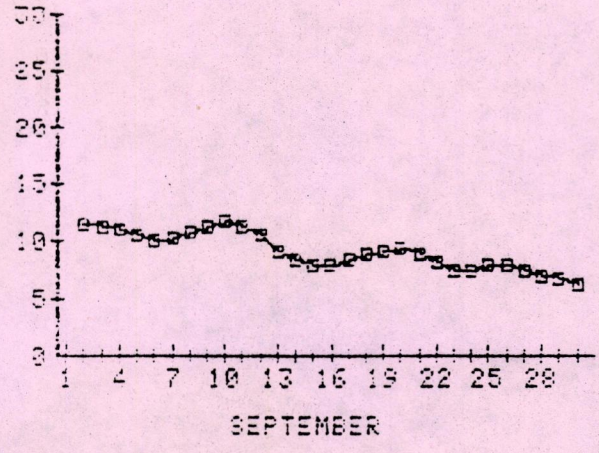
SALMON RIVER & LOWER MIDDLE FORK BREAKS ZONES
HISTORIC ERC TREND GRAPHS
SKULL GULCH C4P2 80% OF MEAN HIGH ERC'S

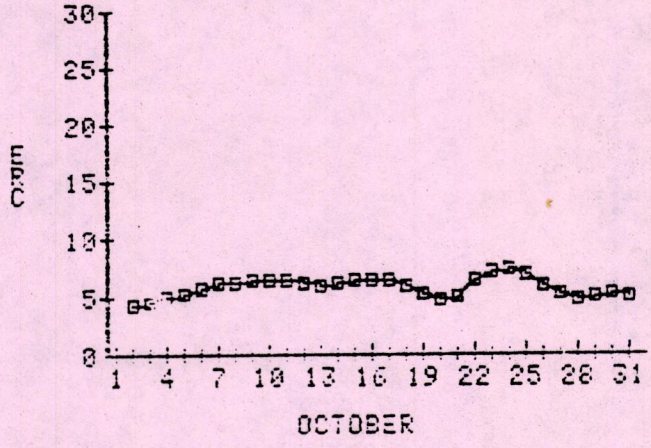




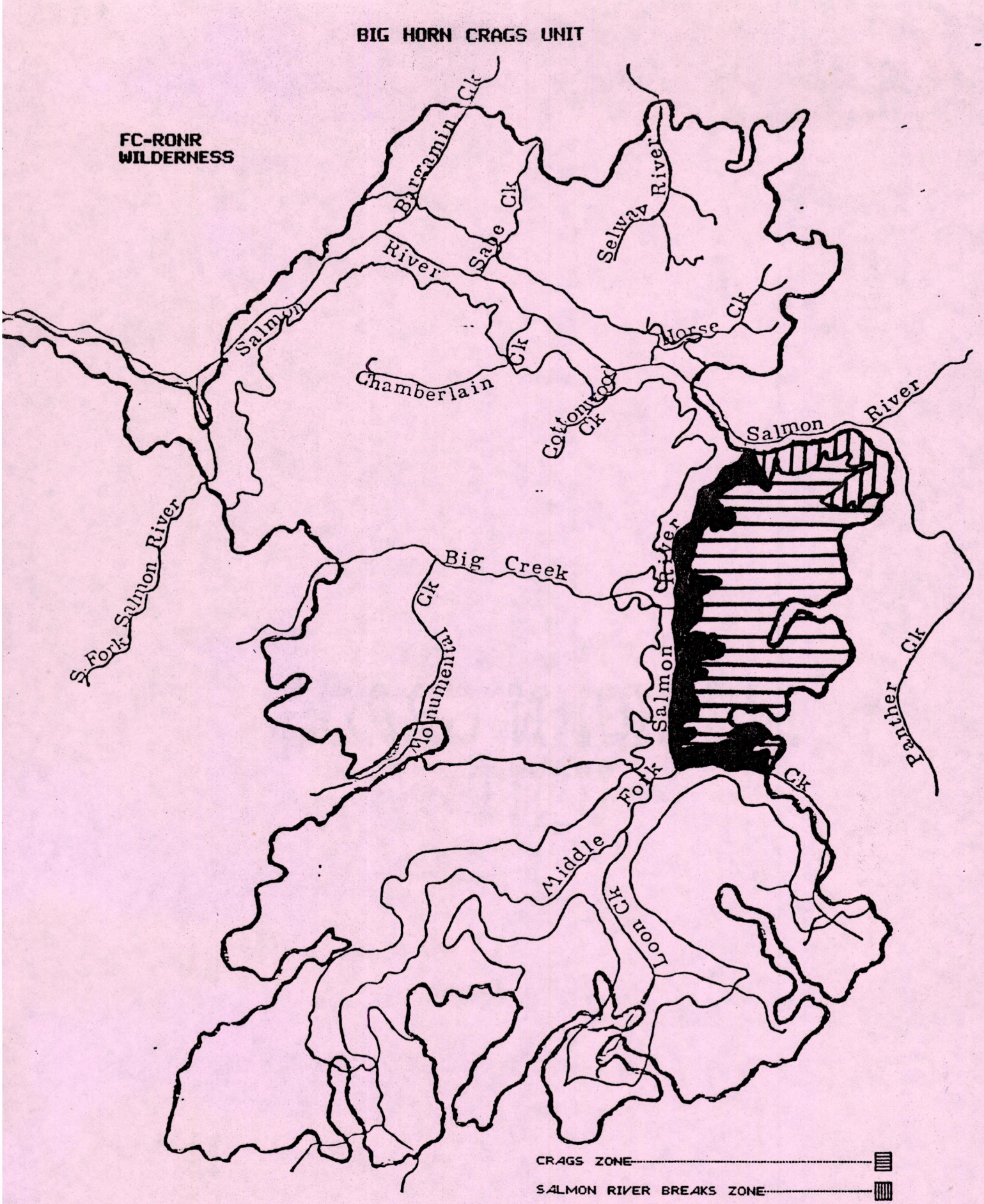




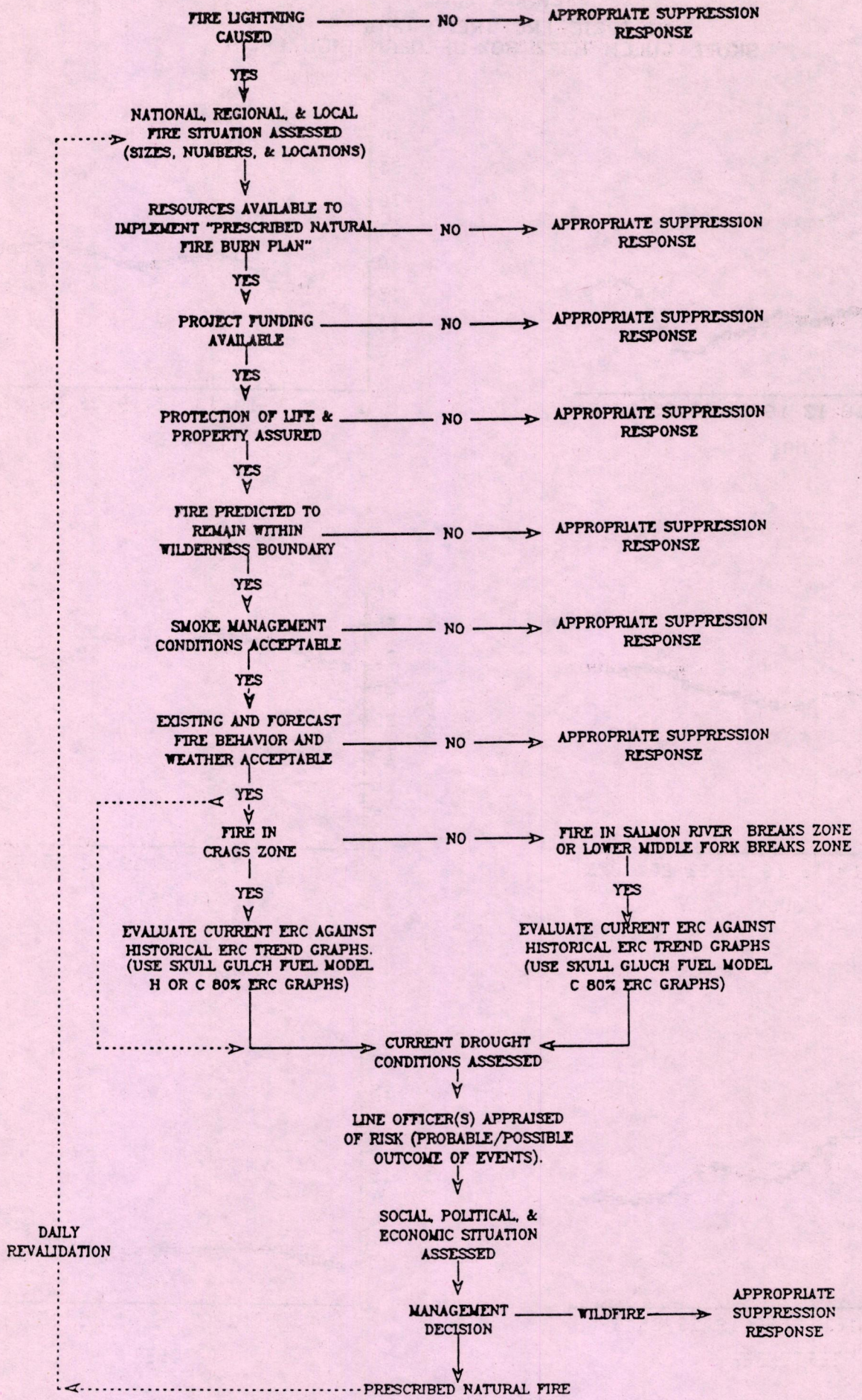




BIG HORN CRAGS UNIT

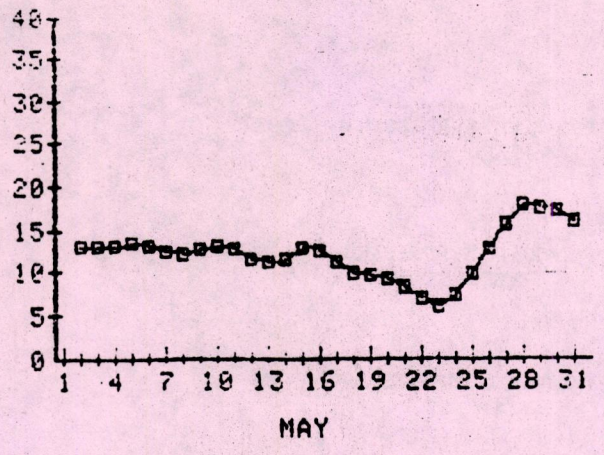

BIG HORN CRAGS UNIT
FC-RONR WILDERNESS
Bargamin Ck
Sabe Ck
Selway River
Salmon River
Horse Ck
Chamberlain Ck
Cottonwood Ck
Salmon River
S. Fork Salmon River
Big Creek
Monumental Ck
Salmon River
Panther Ck
Middle Fork
Loon Ck
Ck
CRAGS ZONE
SALMON RIVER BREAKS ZONE
LOWER MIDDLE FORK BREAKS ZONE

BIG HORN CRAGS UNIT



CRAGS ZONE

HISTORIC ERC TREND GRAPHS
SKULL GULCH H3P2 80% OF MEAN HIGH ERC'S



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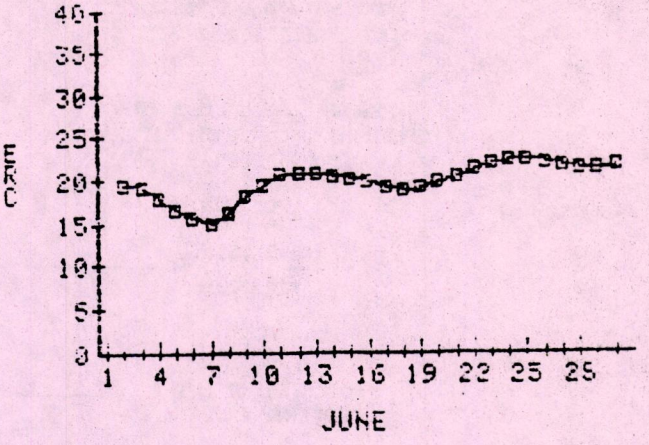

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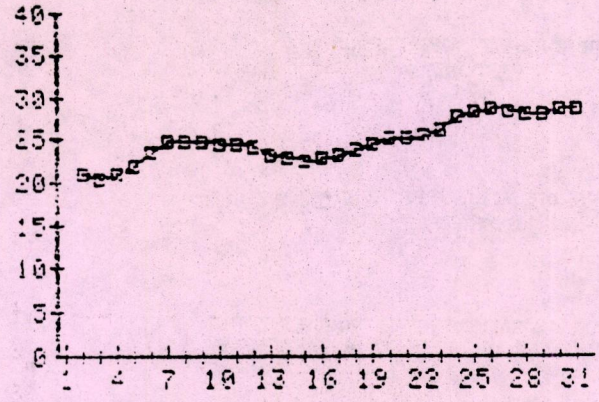

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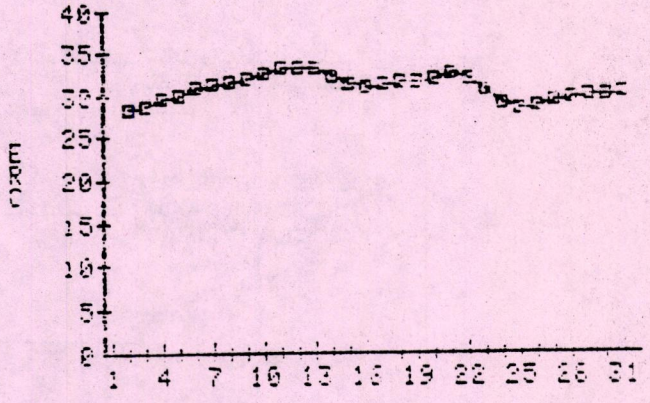

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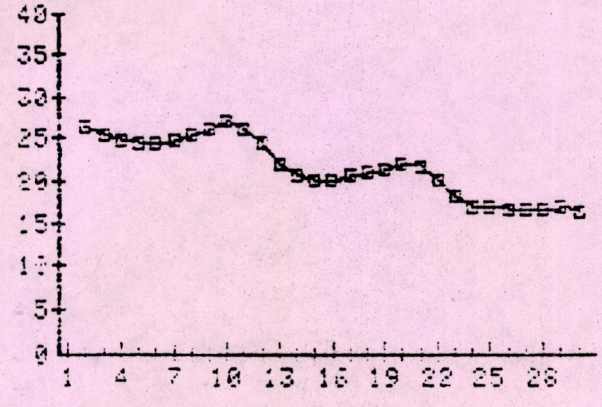

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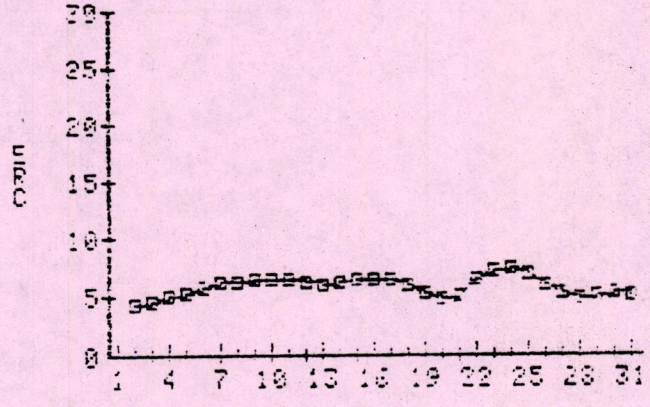
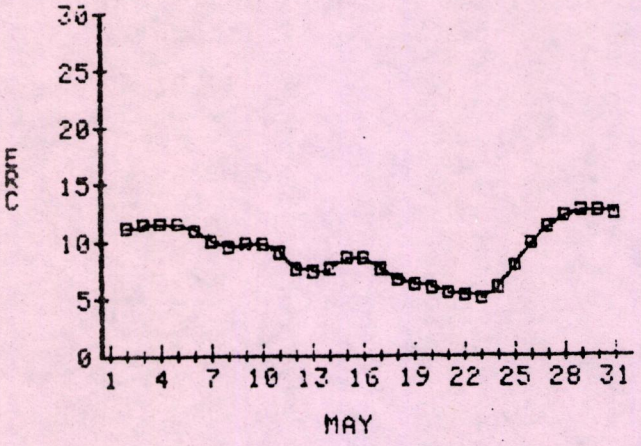
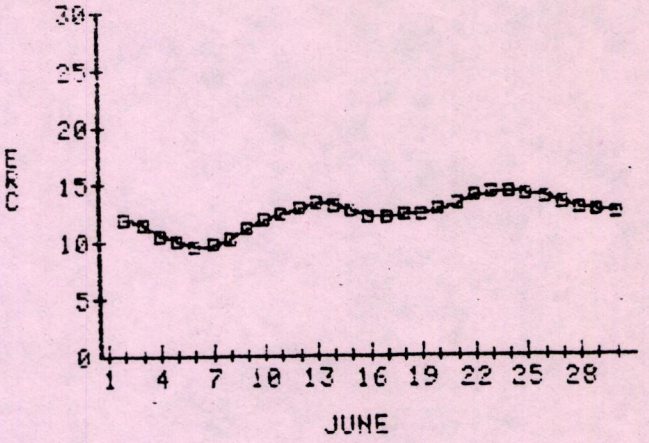
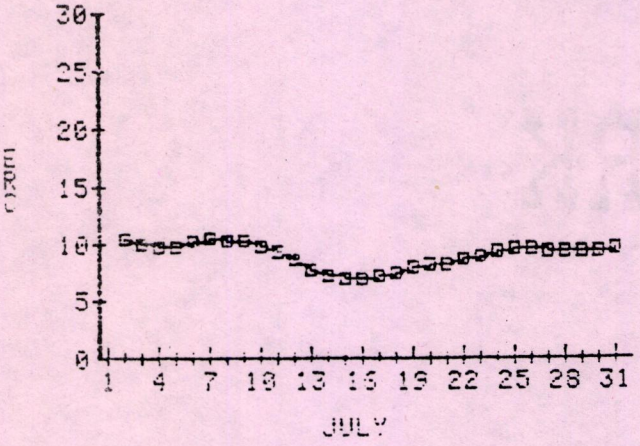


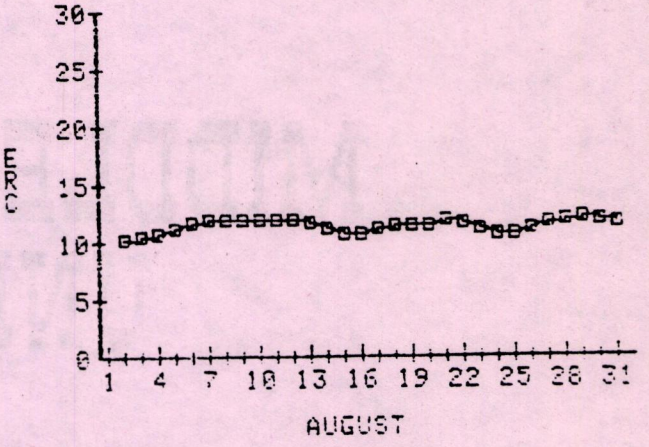
OCTOBER

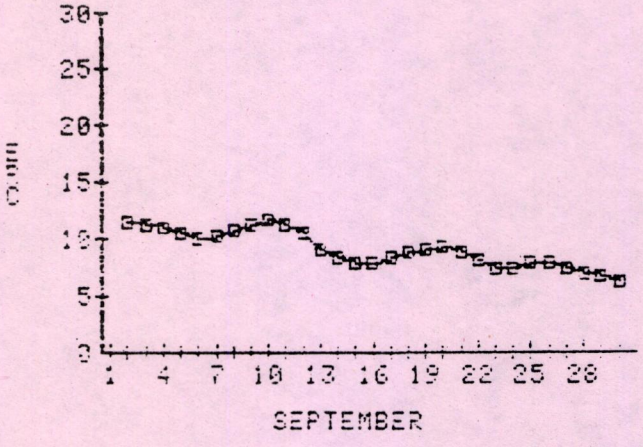
SALMON RIVER & LOWER MIDDLE FORKS BREAKS ZONES
AND CRAGS ZONE
HISTORIC ERC TREND GRAPHS
SKULL GULCH C4P2 80% OF MEAN HIGH ERC'S

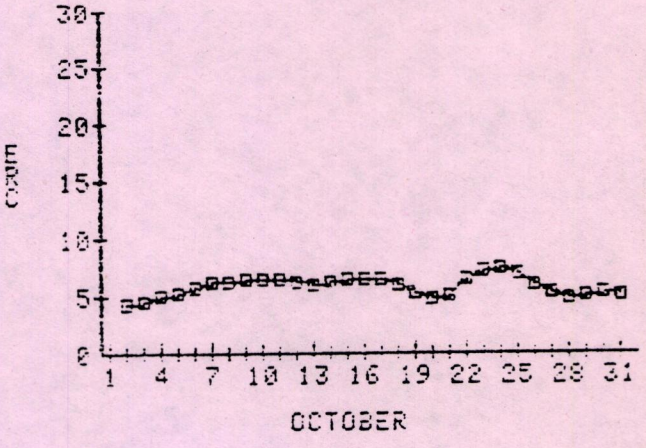




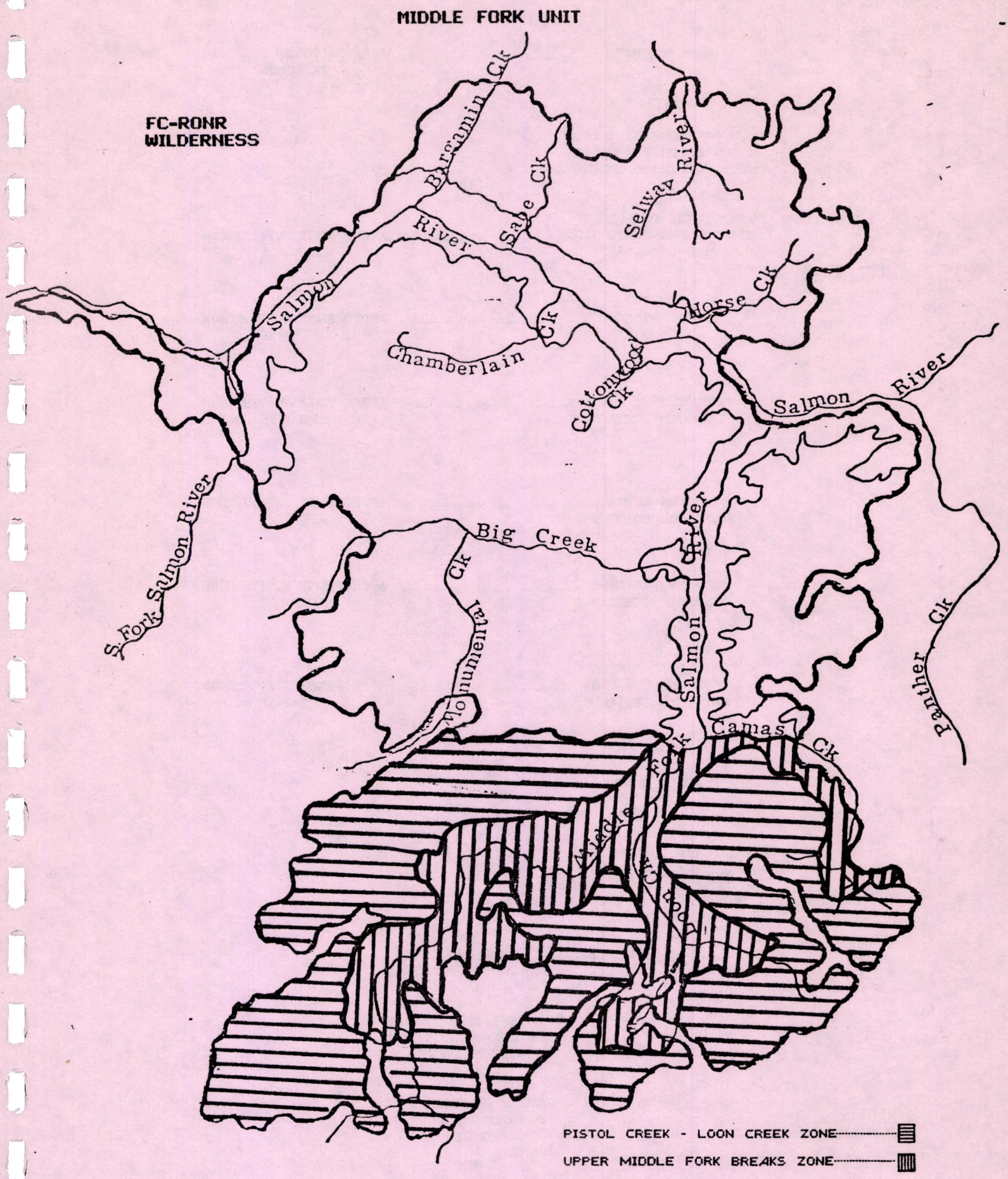




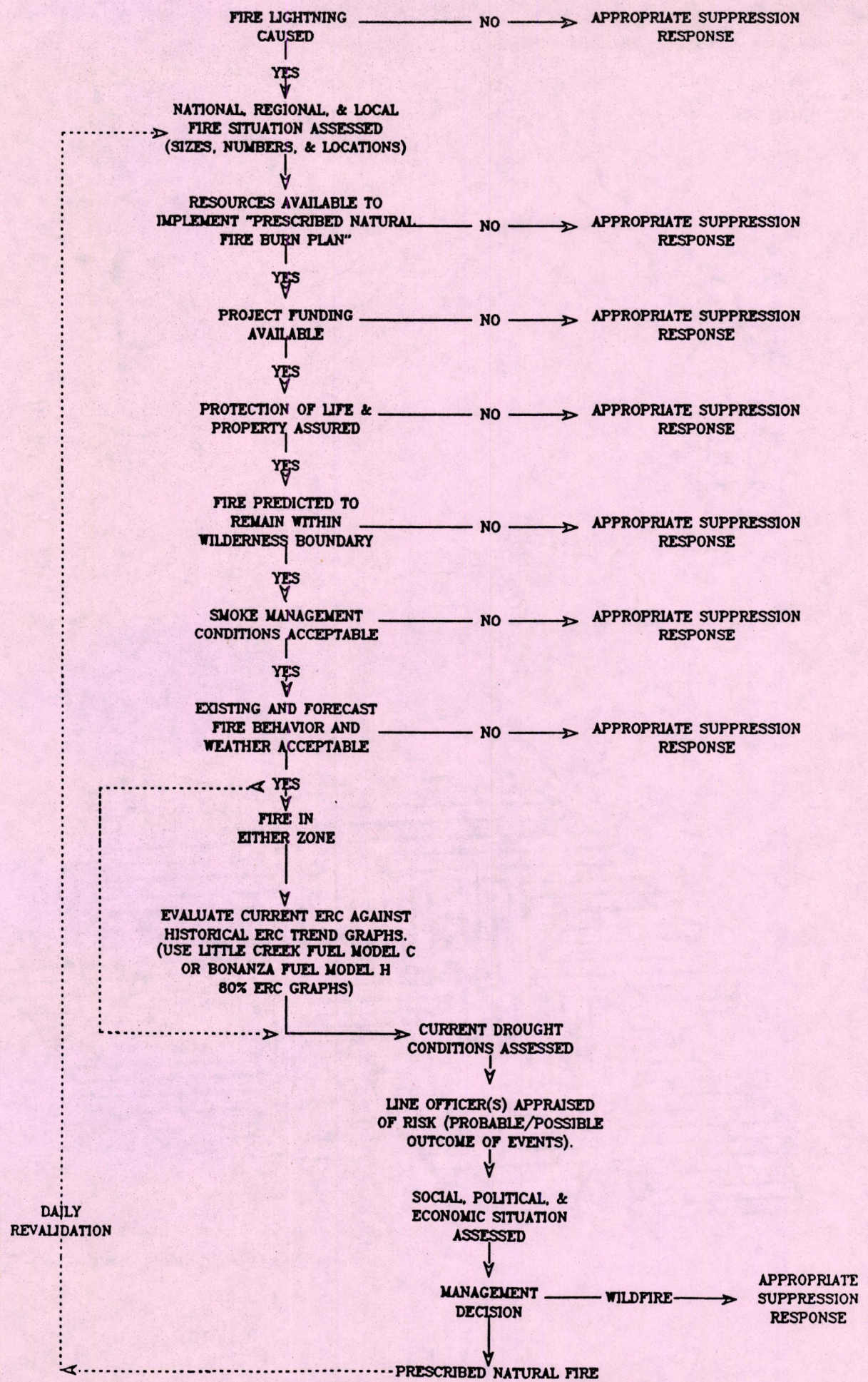




MIDDLE FORK UNIT

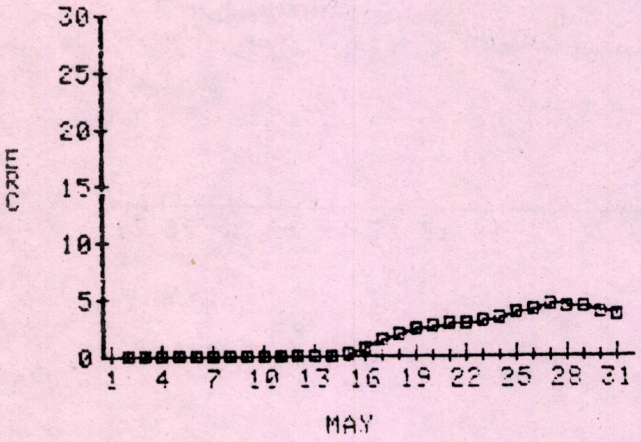

MIDDLE FORK UNIT
FC-RONR
WILDERNESS
Bargamin Ck
Sabe Ck
Selway River
Salmon River
Horse Ck
Chamberlain Ck
Cottonwood Ck
Salmon River
S. Fork Salmon River
Big Creek
Monumental Ck
Salmon River
Camas Ck
Panther Ck
PISTOL CREEK - LOON CREEK ZONE
UPPER MIDDLE FORK BREAKS ZONE

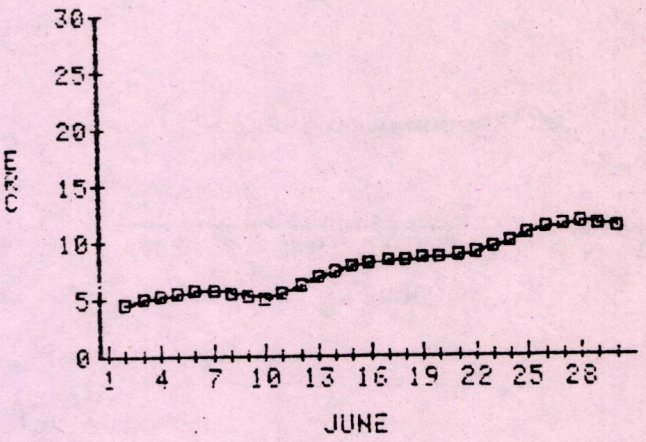
MIDDLE FORK UNIT

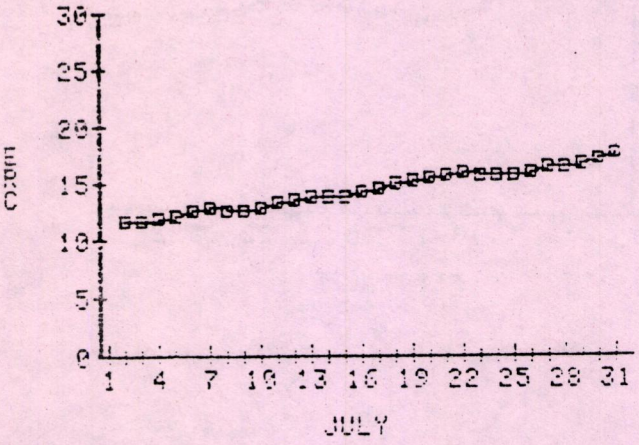


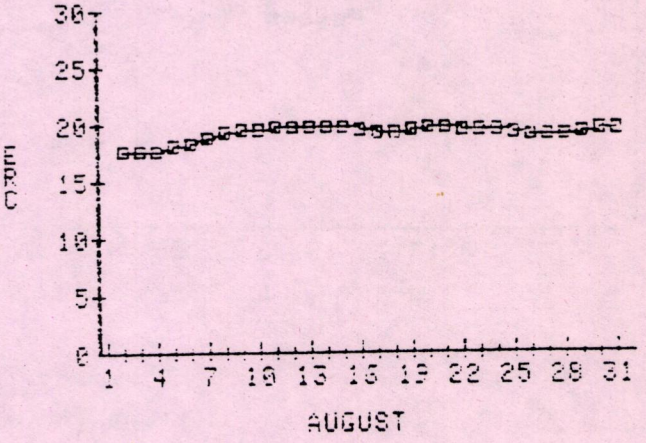
UPPER MIDDLE FORK BREAKS ZONE &
PISTOL CREEK - LOON CREEK ZONE

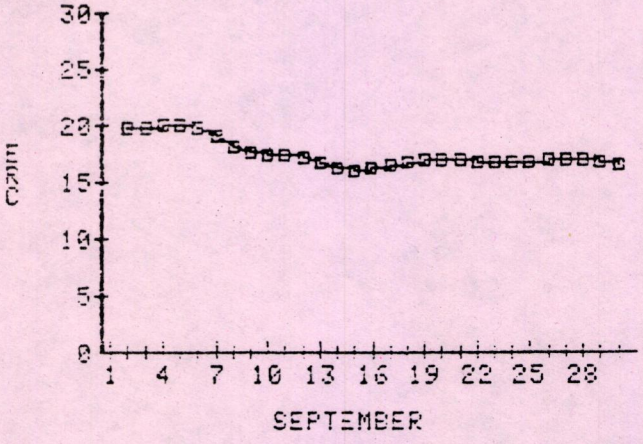
HISTORIC ERC TREND GRAPHS
LITTLE CREEK C3P3, 80% OF MEAN HIGH ERC'S

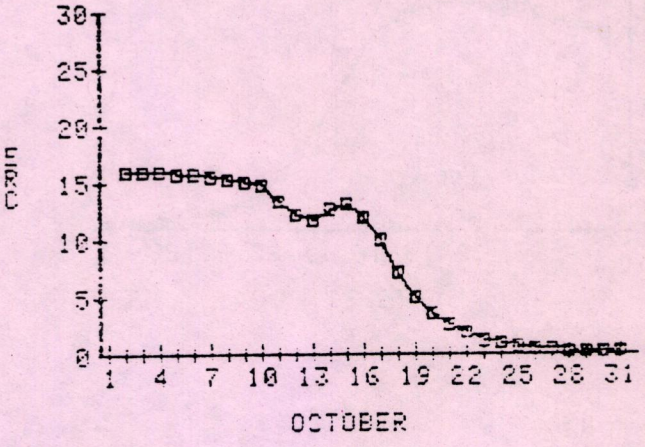




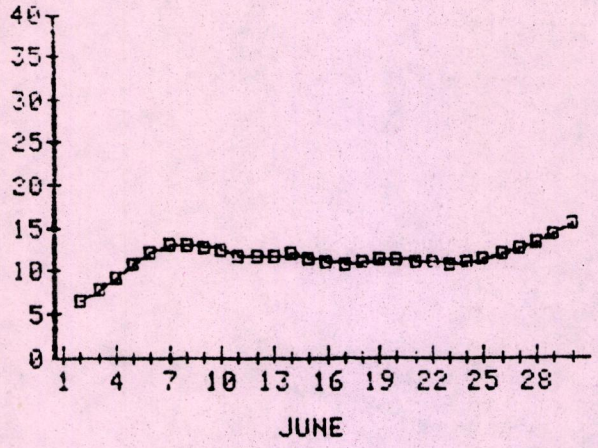








UPPER MIDDLE FORK BREAKS ZONE &
PISTOL CREEK - LOON CREEK ZONE
HISTORIC ERC TREND GRAPHS
BONANZA H3P3, 80% OF MEAN HIGH ERC'S



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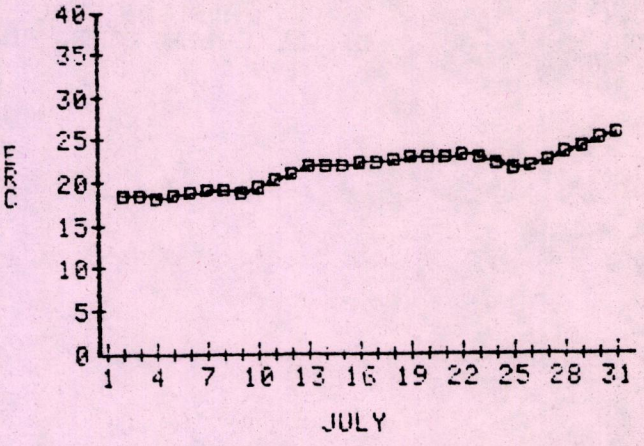

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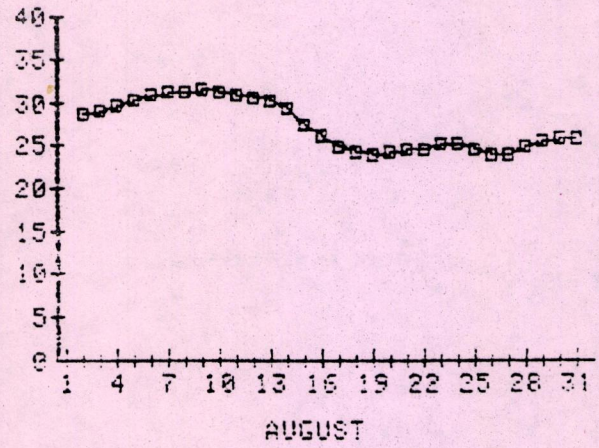

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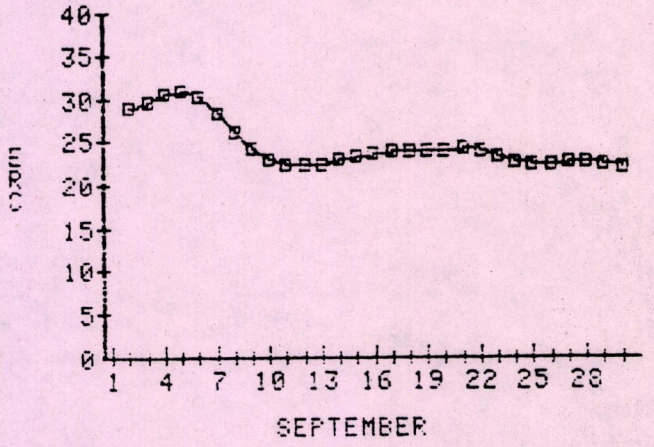

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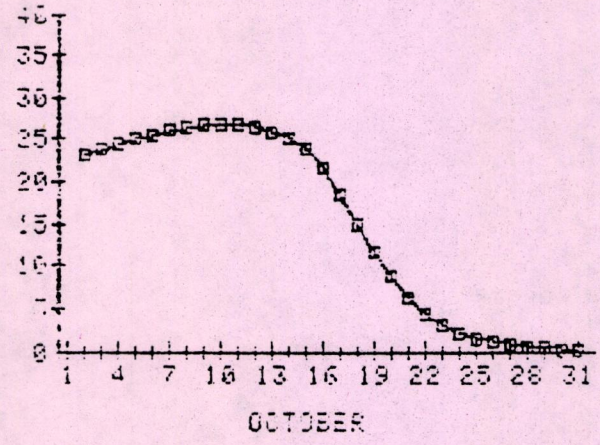

OCTOBER

INCIDENT PLANNING

Once a fire has been declared a prescribed natural fire in the FC-RONR Wilderness, the following incident planning procedures need to be followed to provide a timely recognition of changing fire situations.

1. The re-validation criteria in the decision flow charts will be reviewed daily.

2. The fire will be monitored, as determined by the fire situation level table, to aid in the review of the decision flow charts and to prepare and update the Prescribed Natural Fire Burn Plan (Appendix E.)

3. Each prescribed natural fire will have a Prescribed Natural Fire Burn Plan. This plan needs to be prepared within 48 hours after the initial discovery and should be reviewed periodically to assure it is still valid based on the current and projected fire situation. The Prescribed Natural Fire Plan should include but not be limited to the following:

General Information About the Fire.

Map showing projected perimeters.

Fire Management Planning Scenarios.
Burned area expected under present foreseeable conditions, including total acres and miles of perimeter.
Total burned area expected under adverse conditions including total acres and miles of perimeter.
Maximum allowable size.

Location (general) include Section, Township, and Range.
Prominent landmarks.
Size
Fuel types and fuel models.
Fire groups.
Habitat type/cover type/land type.

Other Information.

Risk assessment, (Criteria from decision and prescriptive flow charts).
Monitoring and daily re-validation procedures/criteria.
Estimate of resources needed to manage Incident.
Funding needs, requirements, and alternatives.
Smoke Management problems (project for life of fire).
Fire weather, fire behavior, and drought forecasts.
Best projected prognosis of weather and fire season.
Holding and contingency actions.
Identifcation of evaluation needs.

Inform and Involve Needs.

Identify specific issues for fire such as:
- Smoke
- Private property
- Recreation

Information exchange between Forests and Regions.

Decision Factors - (examples that can affect a decision to take action on a fire.)

Total fire load - how much is enough?
Fire approaches private property, Wilderness or Zone boundary - when to take action.
Change in smoke drift - affecting sensitive area - what action to take.
Supervisor's comfort - number of complaints or calls.
On/Off-site effects - political, social, economical, and biological.

PLANNED IGNITIONS

BACKGROUND - The intent of this section is to establish the need for planned ignitions within specified areas of the FC-RONR Wilderness by providing the rationale and justification which will meet the necessary policy requirements; and allow for Forest Supervisor approval of Planned Prescribed Burns in these designated areas.

The need for planned ignition in the Main and Middle Fork Breaks of the Salmon River has been recognized. The need for planned ignition prescribed fire in these areas is primarily based on fire history of the area and past fire suppression experience in these fuel types. The breaklands have a history of high fire occurence and large fires. The fuel types and steep topography produce rapid spreading surface fires. These factors contribute to the difficulty of confining fire to the Wilderness. Fires have been frequent events, and while fire suppression efforts have not totally excluded large fire occurence, these efforts have certainly had an effect on many parts of the area.

Some portions of the FC-RONR Wilderness are not isolated within the core of the wilderness. These areas are either narrow "strips" or lie directly adjacent to areas with high commercial values eg. timber or private in-holdings. Prescribed fire resulting from unplanned ignitions is highly complex in these situations. Planned ignitions allow for fire to be returned to the land on a time frame that allows the managers to select fuel and meterological conditions.

The use of planned ignitions, in wilderness, is considered necessary in order to meet the following Fire Management Plan Objectives:

1. Reduce, to an acceptable level, the risks and consequences of wildfire within wilderness, or escaping from wilderness.

Three areas within the FC-RONR Wilderness have been identified as potential sites for planned ignitions; the Main Salmon River Breaks Zone, Upper Middle Fork Breaks Zone, and Lower Middle Fork Breaks Zone (see Fire Management Unit Maps - Appendix G). These are very large areas and there could be specific sites within the areas that will not meet the planned ignition criteria.

PLANNED IGNITION CRITERIA AND JUSTIFICATION - Wilderness Fire Policy on planned ignition (FSM 2324.03...3) states:

3. Forest Service Managers may ignite a prescribed fire within wilderness to reduce unnatural buildups of fuel, only if necessary to meet at least one of the wilderness management objectives set forth in FSM 2324.02 and if all of the following conditions are met:

   (a) The use of prescribed fire or other fuel treatment measures outside of the wilderness is not sufficient to achieve fire management objectives within wilderness.

Most of the proposed areas are contained wholly within the Wilderness and as such do not influence or are not influenced by fuel treatment activities outside the Wilderness boundary. There are sites on the Payette and Nezperce National Forests which contain wilderness boundaries and could be affected by fuel treatment measures outside of the Wilderness; however, fire history studies suggest that fire suppression has altered the fuel complexes in these areas so fuels treatment outside the boundaries exclusively, is not sufficient to accomplish fire management objectives (Barrett 1985).

(b) An interdiciplinary team of resource specialists has evaluated and recommended the proposed use of prescribed fire.

The tiering of this plan to the Frank Church - River of No Return Wilderness Management Plan, and the Draft Plan review by resource specialists will indirectly satisfy this condition. Each individual site specific prescribed burn project will require a forest interdiciplinary team process and approval by the Forest Supervisor.

(c) The interested public has been involved appropriately in the decision.

During the public review of the Frank Church - River of No Return Wilderness Management Plan management alternatives, the public was informed about the proposed use of planned ignitions in the FC-RONR Wilderness. The public was then queried about their position and ideas relative to this issue. The replies showed that 71.4 percent of the respondents favored the wilderness fire management alternatives that provided for planned ignitions.

The draft of this plan was made available to key public interests for their review and comments.

Each planned ignition project that will impact or has the potential to impact private resources either inside or outside the wilderness will require coordination with the involved parties.

(d) Lightning caused fires must be suppressed to avoid serious threats to life and/or property within wilderness or to life, property, or natural resources outside of wilderness.

The areas desiginated for planned ignitions contain approximately 70 percent of the non-federal land parcels and the majority of the high value private in-holdings (resorts, lodges, subdivisions, etc.). These areas also have the highest visitor use, generated primarily from river recreation activities. Portions of the Wilderness below the mouth of the South Fork of the Salmon River on the Payette National Forest and portions below the mouth of Bargamin Creek on the Nezperce National Forest present the highest potential for a fire to escape the wilderness into adjacent high resource value non wilderness. When these conditions are coupled with high potential for large, fast spreading fires, the risk levels for prescribed unplanned ignition fires may be unacceptable.

FIRE SUPPRESSION

APPROPRIATE SUPPRESSION RESPONSE - The decision to use an appropriate suppression response on a given fire ignition is a result of a management determination that the fire does not meet one or more of the criteria in the prescribed fire decision flow chart.

FSM (5105.1) Defines Appropriate Suppression Response as "...the kind, amount, and timing of suppression action on a wildfire which most efficiently meets fire management direction under current and expected burning conditions."

Applying this definition to fire management direction for the FC-RONR Wilderness led to the development of the Initial Action Flow Chart (Figure 7). This decision flow gives primary consideration to protection of life, property, off-site impacts, smoke management, and the relationship of fire costs (FFF) to wilderness resource impacts.

When the decision to use an appropriate suppression response has been made, the impacts of that action on the wilderness must be considered. The FC-RONR Wilderness Management Plan gives the following fire suppression guidelines:

1. Utilize suppression strategies that consider reasonable cost, while emphasizing preservation of wilderness values, protection of private property, and high regard for human safety.

2. Accomplish fire suppression using methods and equipment which least impacts the wilderness.

3. Restrict the use of motorized equipment to that which is essential to safe, efficient accomplishment of the Fire Management Plan direction and is approved by the Forest Service.

4. The use of helicopters for demobilization is limited to cases where the Forest Supervisor determines the use is necessary to meet other fire emergencies, for safety, or when removal by non-motorized means would create significant impacts on the wilderness resource.

5. Limit the use of heavy equipment to exceptional circumstances. Regional Forester approval is required.

ESCAPED FIRE SITUATION ANALYSIS - If initial action taken on a wildfire fails, the fire will be declared escaped. An Escaped Fire Situation Analysis (EFSA) will be prepared and the action prescribed in this analysis will supercede other fire management actions.

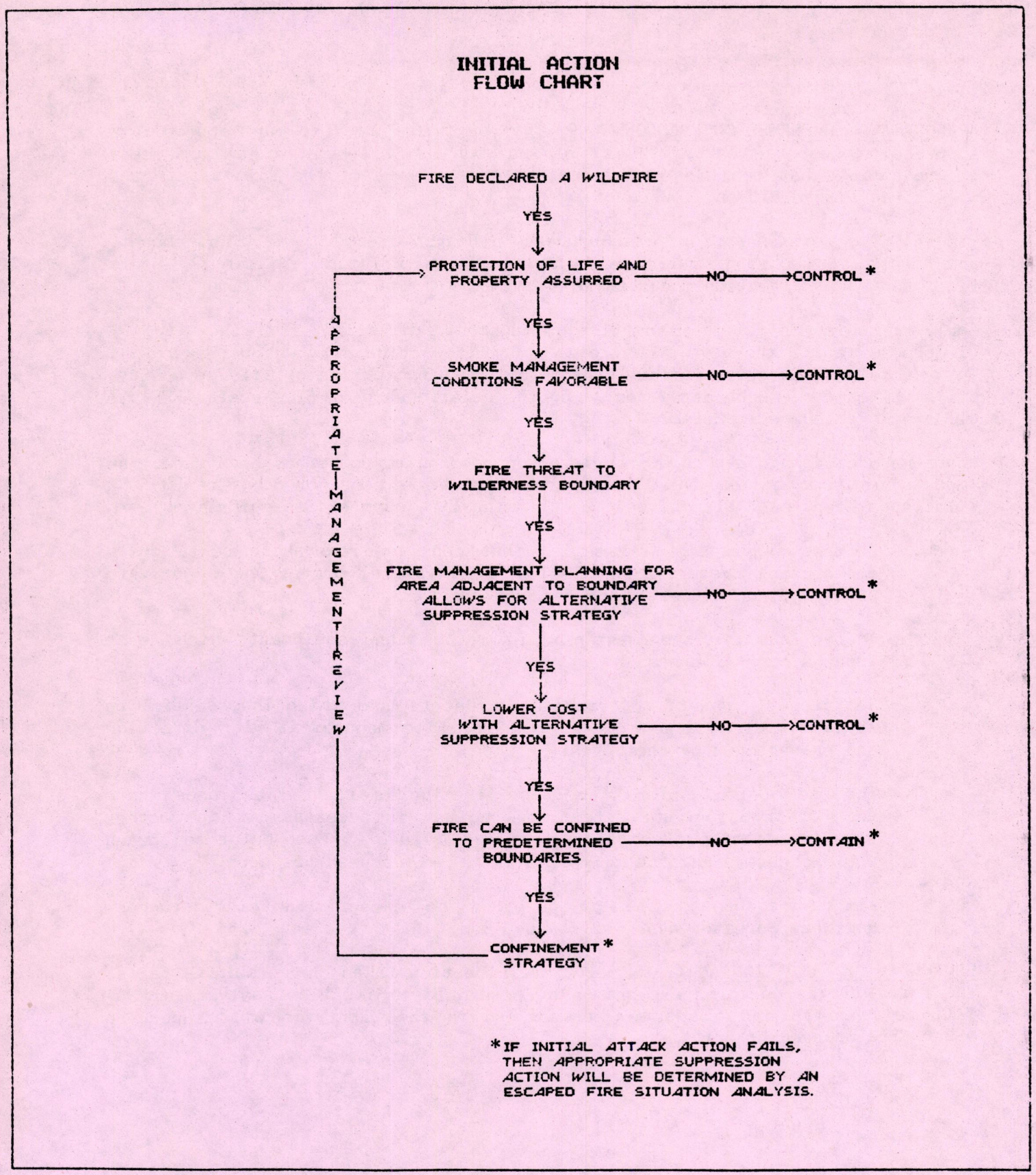
INITIAL ACTION
FLOW CHART
FIRE DECLARED A WILDFIRE
YES
PROTECTION OF LIFE AND PROPERTY ASSURED
NO
CONTROL *
YES
SMOKE MANAGEMENT CONDITIONS FAVORABLE
NO
CONTROL *
YES
FIRE THREAT TO WILDERNESS BOUNDARY
YES
FIRE MANAGEMENT PLANNING FOR AREA ADJACENT TO BOUNDARY ALLOWS FOR ALTERNATIVE SUPPRESSION STRATEGY
NO
CONTROL *
YES
LOWER COST WITH ALTERNATIVE SUPPRESSION STRATEGY
NO
CONTROL *
YES
FIRE CAN BE CONFINED TO PREDETERMINED BOUNDARIES
NO
CONTAIN *
YES
CONFINEMENT * STRATEGY
APPROPRIATE MANAGEMENT REVIEW
*IF INITIAL ATTACK ACTION FAILS, THEN APPROPRIATE SUPPRESSION ACTION WILL BE DETERMINED BY AN ESCAPED FIRE SITUATION ANALYSIS.

Figure 7

FIRE PREVENTION AND FIRE DETECTION

The FC-RONR Wilderness Management Plan provides the following direction for fire prevention and detection within the Wilderness.

1. Accomplish fire prevention and detection activities in such a way as to minimize impacts on visitor's wilderness experience.

   a. Restrict fire prevention signing and contacts to wilderness entrance locations, except where essential to wilderness preservation and resource protection.

   b. Reduce interior visitor contacts as much as practical.

2. Increase the number of visitor contacts at trailheads to inform the majority of visitors.

3. Continue operating lookouts in the Wilderness, as needed.

4. The use of helicopters for servicing lookouts and communications sites will be limited to emergency situations when primitive means cannot meet the need. Forest Supervisor approval is required.

5. Supplement lookout detection with aerial patrol after lightning storms and during periods of high fire danger.

6. Continue existing patrols which include fire responsibilities.

7. Supplement fire prevention efforts during high fire danger periods and in high use areas by increased involvement of Wilderness Rangers.

8. Permit open fires, except when existing and expected fire danger justifies implementation of fire closure orders or as provided for in the Salmon and Middle Fork Salmon Wild River Management Plans.

FIRE MANAGEMENT PLAN EVALUATION

The Fire Management Action Plan will require periodic review to measure how well its elements, (prescriptions, I & I Plan, monitoring procedures, etc.), are working compared to actual fire situations.

In order to provide the necessary information for the review, the following information and documentation will be needed for each fire incident:

Prescribed fires:

Documentation on all management decisions pertinent to the fire incident.

Fire Observation Reports.

Fire Incident Plan.

A final incident summary that analyzes the estimates (costs, size, fire behavior, etc.) in the Fire Incident Report and compares these with the actual fire situation.

Wildfires:

Documentation on all management decisions pertinent to the fire incident.

Escaped Fire Situation Analysis and updates if the fire incident required them.

5100-29, Individual Fire Report.

Annually each of the involved Forests will prepare a composite summary of their fires, both prescribed and wildfires, which will be evaluated by the Forests, Region 1, and Region 4 Fire Management to determine if a revision of components of the Fire Management Action Plan is necessary. These changes could become necessary because of policy or direction changes and/or experience with actual fire situations has shown a need for updating or modification of the plan.

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GLOSSARY OF TERMS

Apppopriate Suppression Response - The planned strategy for suppression action (in terms of kind, amount, and timing) on a wildfire which most efficiently meets fire management direction under current and expected burning conditions. The response may range from a strategy of prompt control to one of containment or confinement.

Confinement - Limiting fire spread within a predetermined area principally by use of natural or preconstructed barriers or enviromnental conditions. Suppression action may be minimal and limited to surveillance under appropriate conditions.

Containment - Surrounding a fire, and any spot fires therefrom, with control line as needed, which can reasonably be expected to check the fire's spread under prevailing and predicted conditions.

Contingency Plan - A plan providing for timely recongnition of approaching critical fire situations, priority setting, and deployment of forces and other action to resolve those situations.

Control - To complete the control line around a fire, and spot fires therefrom, and any interior islands to be saved; burn out any unburned area adjacent to the fire side of the control line; and cool down all hot spots that are immediate threats to the control line, until the line can be reasonably expected to hold under foreseeable conditions.

Escaped Fire Situation Analysis - A decision analysis process from which a plan of action to suppress a fire will be developed. The analysis requires development of alternative suppression strategies, and identifies the probable cost and damage associated with each.

Energy Release Component - a number related to the rate of heat release (B.T.U.'s per second) per unit area (square foot) within the flaming zone of the fire.

Fire Frequency - The historical return interval of fire to a defined environment.

Fire Group - A collection of similar habitat types and their associated fire ecology.

Fire Management Action Plan - That portion of a fire management plan which tells who will do what and when and where the fire management objectives will be accomplished.

Fire Management Direction - Fire management standards, guidelines, and practices based upon land and resource management objectives. Fire management direction is used to define the kind, level, and timing of fire protection and use activities, including the appropriate suppression strategies, which effectively meet management objectives for each management area for a range of expected fire behavior conditions.

Fire Management Unit - A distinct part of the fire management area that can be recognized and mapped from its external features.

Fire Management Zone - All the land within a fire management area that has in common a particular characteristic.

Fuel Model - a simulated fuel complex for which all fuel descriptions required by the mathematical fire spread model have been specified.

Initial Action - The prompt, preplanned response to a wildfire.

Monitoring - The systematic process of collecting and recording fire behavior and environmental data for the purpose of manageing a fire.

Planned Ignition - A fire started by a scheduled, deliberate management action.

Physiographic Areas - Broad descriptions of geographic areas with similar physical and climatic features.

Prescribed Fire - A wildland fire burning under preplanned, specific conditions to accomplish specific planned objectives.

Size Class - An alpha character that represents a relative acre size of wildland fires:

Class A	.25 acres or less
Class B	.26 - 9 acres
Class C	10 - 99 acres
Class D	100 - 299 acres
Class E	300 - 999 acres
Class F	1,000 - 4,999 acres
Class G	5,000 - or more

Unplanned Ignitions - A fire started at random by either natural or human causes, or a deliberate incendiary fire.

Wildfire - Any wildland fire not designated and managed as a prescribed fire within an approved prescription.

APPENDIX

APPENDIX

A

Summary of "Fire History of the River of No Return Wilderness: River Breaks Zone" 1/

ABSTRACT: Fire suppression seems to have interrupted the historic fire frequency in some areas of the Salmon River Breaks section of the RONR Wilderness since about 1930. While some ignitions have taken place in 1931, 1961, 1967, and other years, many ignitions were suppressed that could have developed into spreading fires. The absence of fire may have primarily allowed litter and duff to accumulate on the drier south-facing slopes, but has probably allowed substantial successional advances in the more moist, north-facing communities involving Douglas-fir regeneration.

I. Non-wilderness sample: Colson Creek: (3,000 acre study area, North Fork Ranger District, Salmon National Forest)

While the earliest fire scar dated from about 1464, the Master Fire Chronology for Colson Creek extends from 1707 to 1919. About 59 fires burned during this 212 year period, for a Mean Fire Interval (MFI) of 3.6 years. (A fire occurred somewhere in the 3,000 acre study area about every 3.6 years).

Eleven "major" fires (more than 1,000 acres in size) occurred in the drainage between 1707 and 1919, giving a MFI for major fires of about 21 years. Thus nearly 1 fire in 5 burned substantial acreage. Virtually the entire 3,000 acre study area (and probably much more) burned in the years 1863, 1880, and 1919.

1/ From final report prepared by Stephen W. Barrett, Systems for Environmental Management, 1984.

Looking at 10 stands of less than 100 acres each, MFI's for the pre-fire suppression (pre-1935) period ranged from 10-18 years (10-stand mean of 13.8 years). The shortest interval found was 3 years and the longest was 35 years. No differences were found related to aspect.

The historic pattern was one of frequent, predominantly surface fires. Stands were relatively open and highly uneven-aged (few age classes could be found). There was a lack of fire mosaic patterns in the lower elevations of the dry, south-oriented drainages in the River Breaks zone.

The last large fire occurred in the study area 65 years ago, in 1919. This long fire-free interval is unprecedented over at least the last 200 years, and evidently reflects efficient fire suppression. Too few fires have burned during the suppression period (post-1935) to be able to calculate a meaningful MFI for the stands. In these dry lower elevation sites, litter accumulation may be the most serious result of fire suppression. Successional changes are more evident in the more moist habitat types, on northerly aspects or above 5,000 feet elevation (see later discussion).

I. Wilderness Sample -- Chamberlain/Disappointment Creek: (4,000 acre study area, Big Creek Ranger District, Payette national Forest)

The Master Fire Chronology for the higher elevation (6,000 feet) Chamberlain/Disappointment Creek unit extends from 1730 to 1934. Fewer fires were recorded in this area, by comparison with Colson Creek. About 18 fires burned during the 204 year period, for a MFI of 12 years. Six major fires occured in the study area between 1730 and 1934, giving a MFI for major fires of about 41 years. More than 70 percent of the sample trees were scarred by fires in 1846, 1898 and 1919.

MFI"S for the pre-suppression period in 10 stands ranged from 15-36 years (10 stand mean of 22.5 years). The shortest interval found was 5 years and the longest was 52 years.

Catfaced trees were less common and had fewer scars on moister sites, suggesting that densely stocked, even-aged Douglas-fir stands on north slopes burned less frequently than dry, open ponderosa pine stands. No frequency could be determined for stand-replacement fires.

The last major fire year here was also 1919, although a relatively small fire occurred in 1934. The current long fire-free interval (stand mean of 60.5 years) is also unprecedented over the past two centuries. On the more moist aspects, stand succession is progressing toward domination by Douglas-fir, although on dry aspects, ponderosa pine is still the only species regenerating successfully.

III. Wilderness Sample -- Salmon River Corridor: (Nine 100-acre or less stands, found between Killum Point and Groundhog Bar along 40 miles of the Salmon River Corridor).

Five stands were located on the dry aspect north (south-facing) side of the river and four on the more moist aspect south (north-facing) side of the river. While the earliest scar dated from 1647, the Master Fire Chronologies for these nine stands were generally about 200 years in length. MFI's for these stands ranged from 10 to 48 years (9-stand mean was 19.9 years). The 5 south-facing stands had a mean MFI of 13.9 years, with the shortest interval being 2 years and the longest 39 years. Three north-facing stands had a mean MFI of 30.9 years, with the shortest interval of 9 years and the longest of 95 years.

Fires were clearly more frequent in dry, open ponderosa pine stands where surface fires were common, while fires were less frequent and occasionally resulted in stand-replacement in the more heavily fueled north-facing stands of Douglas-fir and shrubs. The last major fire here also seems to be 1919, although several lesser fires were found up to 1931. The current fire-free interval averages nearly 57 years for the nine stands.

On south-facing slopes, duff accumulation is the main result of fire's absence, while on north-facing slopes, dense regeneration of Douglas-fir is replacing ponderosa pine in understories of most stands and both living and downed fuels are increasing.

Table A.--Comparison of Master fire chronology, major fires, and pre-suppression stand fire history for three study areas RONR Wilderness.

Study Area Name (elevation)	Size in acres	Master Fire Chronology Period	No. fires	MFI (years)	Mean Years since last fire	Major Fires (>1000 acres) No. fires	MFI years	Noteworthy years	Pre-Suppression (pre-1935) stand fire history (<100 acres) Range of fire intervals	Range of stand MFI	Mean of stand MFI
Colson Creek (3,200'-6,000')	3,000	1707-1919	59	3-6	61.9 years	11	21	1863 1880 1919	3-35	10-18	13.8
Chamberlain/ Disappointment (6,000')	4,000	1730-1934	18	12	60.5 years	6	41	1846 1898 1919	5-52	15-36	22.5
Salmon River Corridor (2,300'-3,300')	Nine 100 Acre units				56.7 years			1889 1919	2-95	10-48	19.9
S-facing	(N-side) (5 stands)								2-39		13.9
N-facing	(S-side) (3 stands)								9-95		30.9

APPENDIX

B

FIRE MANAGEMENT
RESPONSE SHEET
ANALYSIS
REPORT

February 9, 1984

Prepared by: Tom Patten
Working Team Leader

Mike Oliver
North Group Leader

INTRODUCTION

This paper is composed of two separate reports. One contains an analysis of the Fire Response Sheets, and the other is a conclusion report based on the data contained in the Response Analysis. The reason for two reports was to maintain the separate objectives of each report and not influence the results of one report with those of the other. This also allows readers to formulate their own conclusions based on the analysis data and not be biased by the conclusions developed by the Working Team.

ACKNOWLEDGEMENTS

We would like to acknowledge several people for their assistance with these reports:

1. The Wilderness Planning Team for their efforts in getting the Fire Management Fact and Response Sheets to the public and then coding them for us when they were received.

2. Tina Schwartzman, Bitterroot P.I.O., for the help in providing direction and ideas for conducting these reports.

Our task was made much easier by their help and guidance.

FIRE MANAGEMENT
RESPONSE SHEET
ANALYSIS
and
CONCLUSION
REPORTS

The purpose of this analysis is to summarize and document the number, content, and nature of the public response to the Fire Management Fact and Response Sheets (Attachment #2) sent out by the Wilderness Planning Team in conjunction with the array of management alternatives package.

The array package was released to the public on October 17, 1983, and had a reply deadline of December 1, 1983. This gave the respondents 46 days to review the package and reply on its contents. Of the 530 array packages sent out, 362 were returned. Out of the 362 respondents, 92 addressed Fire Planning; and of those, 63 addressed Fire Planning through the Response Sheets or a letter. Those 63 responses were the data base for this report. This analysis only summarizes and consolidates comments by the respondents and does not attempt to assign a weighted value or draw conclusions from them. In order to accomplish this, the operating procedures outlined in Attachment #1 were used.

DATA ANALYSIS

ISSUE #1. The effects of smoke from large fires on wilderness visitors, airstrips, private in-holdings, outfitters and guides, and adjacent airstrips.

A. Thirty-seven respondents (58.7%) felt that smoke from large fires was not a significant problem or major concern. The key reasons for their views were:

1. Smoke part of the natural ecosystem
2. Effects are of short duration
3. Effects are minimal
4. Smoke is part of the wilderness experience
5. Effects of smoke outweighed by wilderness values
6. Smoke is unavoidable consequence of fire

B. Ten respondents (15.9%) expressed concerns or felt that smoke from large fires did have significant impacts. The key reasons for their views were:

1. Number of large fires creates heavy smoke load
2. Impedes fire detection
3. Maintain wilderness as Class I airshed
4. Interferes with air traffic
5. May cause injury to those with existing health problems

C. Sixteen respondents (25.4%) had no comment on this issue.

ISSUE #2. Protection from fire for private in-holdings and special-use permit areas.

A. Twenty-eight respondents (44.4%) felt that protection of private in-holdings and/or special use areas was a significant problem or responsibility. The key reasons for these views were:

1. Protect all permit areas and in-holdings as an agency responsibility
2. Use planned ignition to protect in-holdings

B. Seventeen respondents (27%) felt protection of private in-holdings and/or special-use areas was not a significant problem or responsibility. The key reasons for these views were:

1. Provide no protection - the risks are part of the environment
2. In-holder should bear the risk
3. In-holders should share protection
4. Protect only if fire a consequence of planned ignition
5. In-holders should carry own fire insurance

C. Eighteen respondents (28.6%) did not have comments on this issue.

ISSUE #3. Public understanding, acceptance, and support for a prescribed fire program in the wilderness.

A. Thirty-nine respondents (61.9%) felt there was some level of public support for a prescribed fire program in the wilderness. The key reasons for these views were:

1. General support with education
2. Education about Natural Fire Program

a. Of the thirty-nine respondents who showed general support for prescribed fire in the wilderness, 26 expressed a need for public education on wilderness fire management. They felt a need for the following:

1) Public information systems
2) Major media programs
3) Printed material
4) Natural Fire Program education
5) Prescribed Fire education programs

B. Four respondents (6.3%) felt there was a lack of support and understanding of a prescribed fire program in wilderness. The key reasons for their views were:

1. Support for wilderness prescribed fire is with special interest groups
2. Over-sold Fire Prevention/Suppression programs

C. Twenty respondents (31.7%) did not comment on this issue.

ISSUE #4. Effects of fires on wildlife and their habitat.

A. Forty-one respondents (65.1%) did not feel there would be significant adverse effects on wildlife from fire. Also included in this category are those who felt there were definite benefits to wildlife. The key reasons for their views were:

1. Wildlife have evolved with fire
2. Fire is part of the natural ecosystem
3. Fire may improve wildlife habitat
4. Benefits outweigh the adverse impacts
5. Wildlife coexist with fire
6. May enhance wildlife population
7. Most species adapted to fire
8. Long-range effects are generally beneficial
9. Game species populations may increase

B. Four respondents (6.3%) felt there would be some significant adverse impacts on wildlife with prescribed fire. The key reasons for these views were:

1. May eliminate old growth species habitat
2. Fire may damage winter range vegetation
3. Fish may need restocking in badly burned areas
4. Sediment in fish habitat

C. Fifteen respondents (25.4%) did not comment on this issue.

D. Two respondent's comments (3.2%) could not be classified.

ISSUE #5. Effects of fires on fish and their habitat.

A. Twenty-three respondents (36.5%) felt that there was no significant adverse impacts and/or that there may be possible benefits on fish populations with a prescribed fire program in wilderness. The key reasons for their views were:

1. Fish have coexisted with fire in the past
2. Impacts are short duration
3. Aquatic life has evolved with fire
4. Fire part of the natural ecosystem
5. Fish habitat may be enhanced by fire
6. Sediment from fire is less than from fire suppression actions

B. Fifteen respondents (23.8%) felt a prescribed fire program in wilderness would have significant adverse impacts on fish populations or that some protection measures were needed. The key reasons for their views were:

1. Increased sedimentation with fire
2. Need to protect anadromous fisheries
3. Protect riparian zones
4. Site-specific actions on a case-by-case basis
5. Protect lakes and spawning areas from fire
6. Aquatic life may be less adapted to fire than terrestrial populations

C. Twenty-five respondents (39.7%) did not comment on this issue.

ISSUE #6. Reasonable provisions for visitor safety.

A. Twenty-one respondents (33.3%) felt that visitor safety was a primary concern and/or major responsibility of those implementing a prescribed fire program in wilderness. The key reasons for their views were:

1. Helicopter rescue
2. P.A. systems on helicopters to warn visitors
3. Close trailheads
4. Operate warning systems at portals with personnel
5. Patrolman at fire and signing at fire
6. Evacuation of endangered personnel
7. Mandatory registration

B. Twenty respondents (31.8%) felt visitor safety was not a primary concern and/or agency responsibility was limited to information or less. The key reasons for their views were:

1. Public information only
2. Visitors travel at their own risk
3. Fire is part of the natural ecosystem
4. Trailhead notification only
5. Part of the wilderness experience

C. Twenty-two respondents (34.9%) did not comment on visitor safety.

ISSUE #7. Unnaturally high fuel accumulations may exist due to past fire exclusion policies.

A. Thirty-six respondents (57.1%) felt that there was some level of unnatural fuel accumulations.

1. Total fire suppression has allowed accumulation
2. Man's influence has altered ecosystems
3. Need is obvious to reduce fuel

B. Five respondents (7.9%) felt that unnatural fuel accumulations did not exist.

1. Past fires have kept fuel accumulations down
2. Research needed to verify
3. Present fire suppression has not occurred long enough to allow accumulations
4. Cannot see an evident problem
5. Amounts of unnatural accumulation are not significant
6. No clearcut definition of natural

C. Twenty respondents (31.8%) did not comment on this issue

D. Two respondent's comments (3.2%) could not be classified

ISSUE #8. The threat to lands outside the wilderness from lightning fires that might be allowed to burn be contained within the wilderness when burning in high rate of spread fuel types on steep slopes in some parts of the wilderness.

A. Twenty-three respondents (36.6%) felt that there was a significant threat to areas outside the wilderness and fires that occurred on high potential sites should have some containment action taken. The key reasons for their views were:

1. Fires should be evaluated on a case-by-case basis (site specific is the key).
2. High fire indices should determine containment action (some control during critical fire weather).
3. In steep slopes and flashy fuels, fire will escape the wilderness
4. Private land and resource values outside the wilderness must be protected
5. Containment should be undertaken to protect boundaries

B. Twelve respondents (19.1%) felt fires in high potential areas were not a significant threat to areas outside the wilderness and no containment action should be taken. The key reasons for these views were:

1. Areas outside the wilderness could benefit from fire originating in the wilderness
2. Fire is natural and should be allowed to burn in all areas of the wilderness
3. Contain only fires that threaten wilderness boundaries

C. Twenty-one respondents (33.3%) did not comment on this issue.

D. Seven respondent's comments (11.1%) could not be classified.

ISSUE #9. Prescribed burning from planned ignitions may play a wilderness management role in the future.

A. Thirty-eight respondents (60.3%) felt that planned ignitions may or should play some part in future prescribed fire programs. The key reasons for their views were:

1. Will help decrease fuel accumulations
2. May enhance wildlife habitat
3. Fireproof some areas
4. Will help restore successional vegetative mosaics
5. May increase big game species
6. Planned ignition is legal

B. Eleven respondents (19.1%) felt that a planned ignition prescribed fire program should not play a part in future prescribed fire programs in the wilderness. The key reasons for their views were:

1. Can see no justification
2. Not natural process
3. Research is needed to show a need
4. No definition of natural

C. Twelve respondents (19.1%) did not comment on this issue.

D. Two respondent's comments (3.2%) could not be classified.

ISSUE #10. The wilderness may be stratified into meaningful fire management units so that site specific prescriptions safeguard life and property and avoid serious smoke impacts, while furthering wilderness resource objectives.

A. Thirty-four respondents (54%) felt wilderness could be stratified into meaningful management units. The key reasons for their views were:

1. Important wilderness management concept
2. Important in planning process

B. Five respondents (7.9%) felt wilderness could not or should not be stratified into fire management units. The key reasons for their views were:

1. Issue is just government rhetoric
2. Stratification not needed "Okay in its present status"

C. Twenty-one respondents (33.3%) did not comment on this issue.

D. Three respondent's comments (4.8%) could not be classified.

ALTERNATIVES

Alternative "A" - Develop prescriptions allowing lightning fires (unplanned ignitions) to burn to achieve wilderness resource objectives. Suppress those fires that threaten life or property, or threaten to escape outside wilderness.

This alternative was supported by 15 respondents (23.8%). The key reasons for support were:

1. Has the least human intervention
2. Don't agree with planned ignitions
3. The most "natural alternative"
4. One respondent supported "A" with the addition of human caused fires

Alternative "B" - Suppression of all fires; no prescribed fire program. This alternative did not receive any support from the respondents.

Alternative "C" - Develop a program for using prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objectives.

This alternative was supported by 23 respondents (36.5%). The key reasons for support were:

1. Control where and when fires occur
2. Provide manager flexibility
3. Needed to reduce unnatural fuel accumulations
4. Needed to restore natural conditions

Alternative "D" - Develop a program emphasizing the use of prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objectives. Human-caused unplanned ignitions will be treated as natural fires when all other prescription criteria are met.

This alternative was supported by 22 respondents (34.9%). The key reasons for support were:

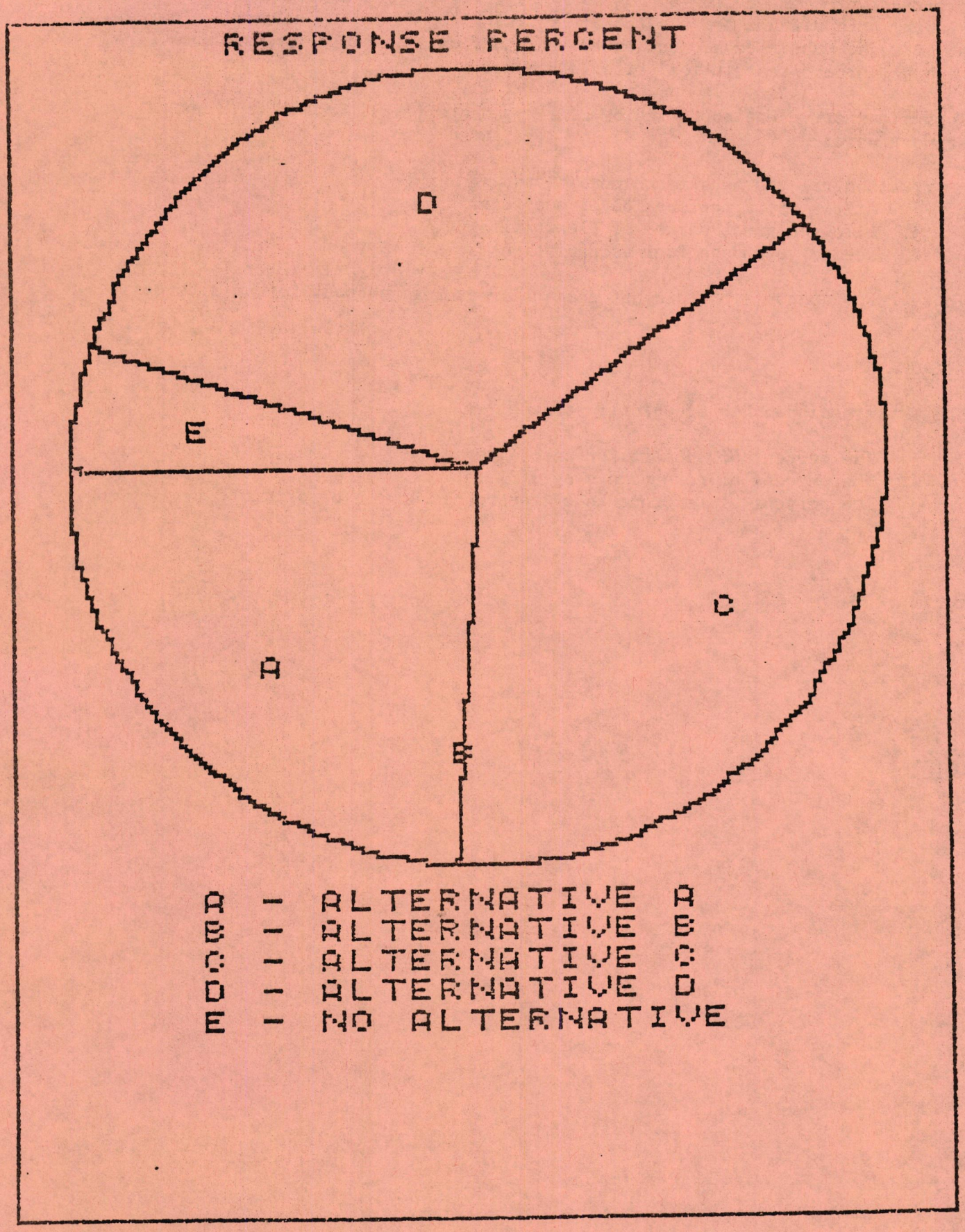
1. Control the season and conditions
2. Allows rapid restoration of ecosystems
3. Allows a great degree of flexibility
4. Needed to reduce fuel accumulations

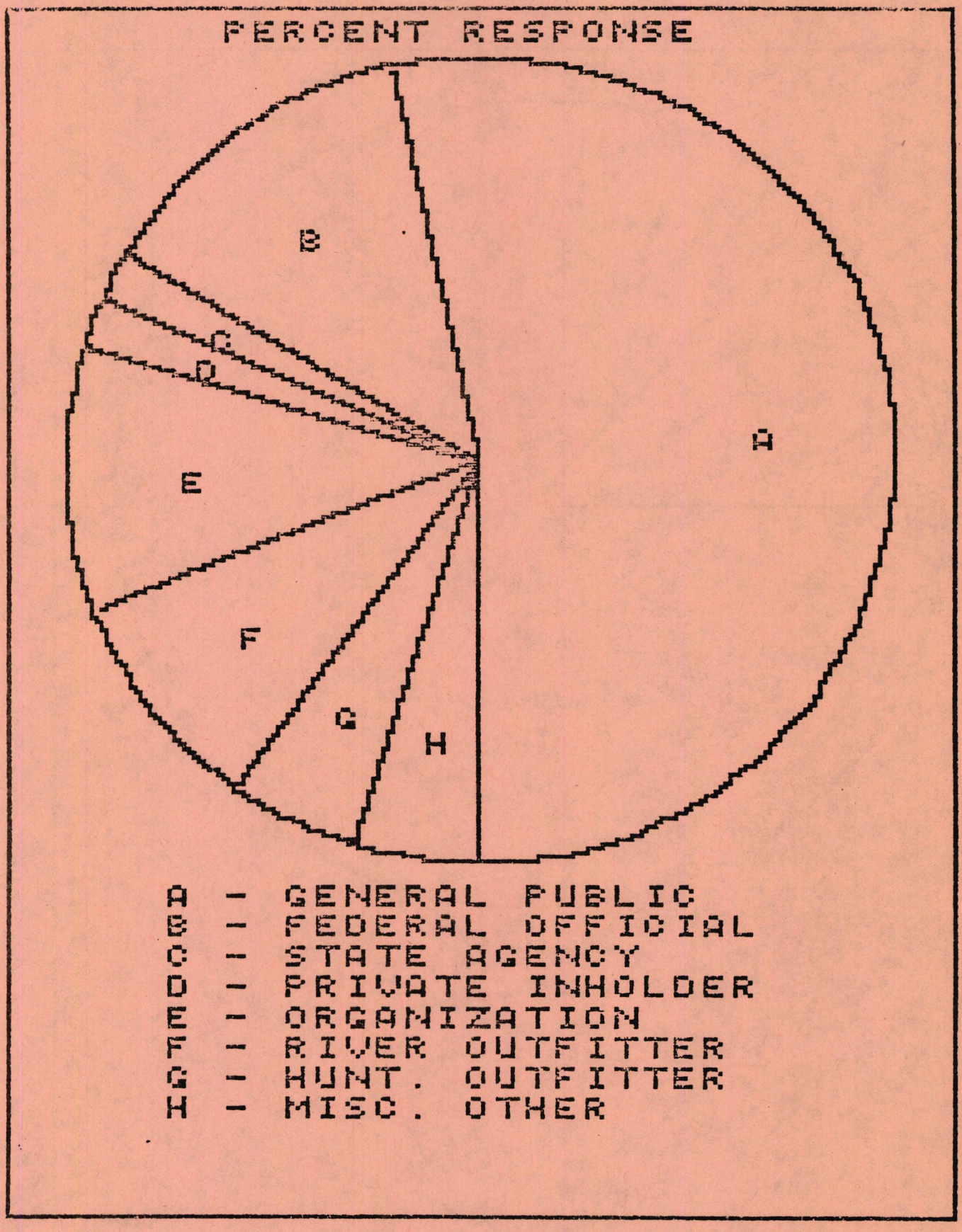
Three respondents (4.8%) did not comment or express support for an alternative.

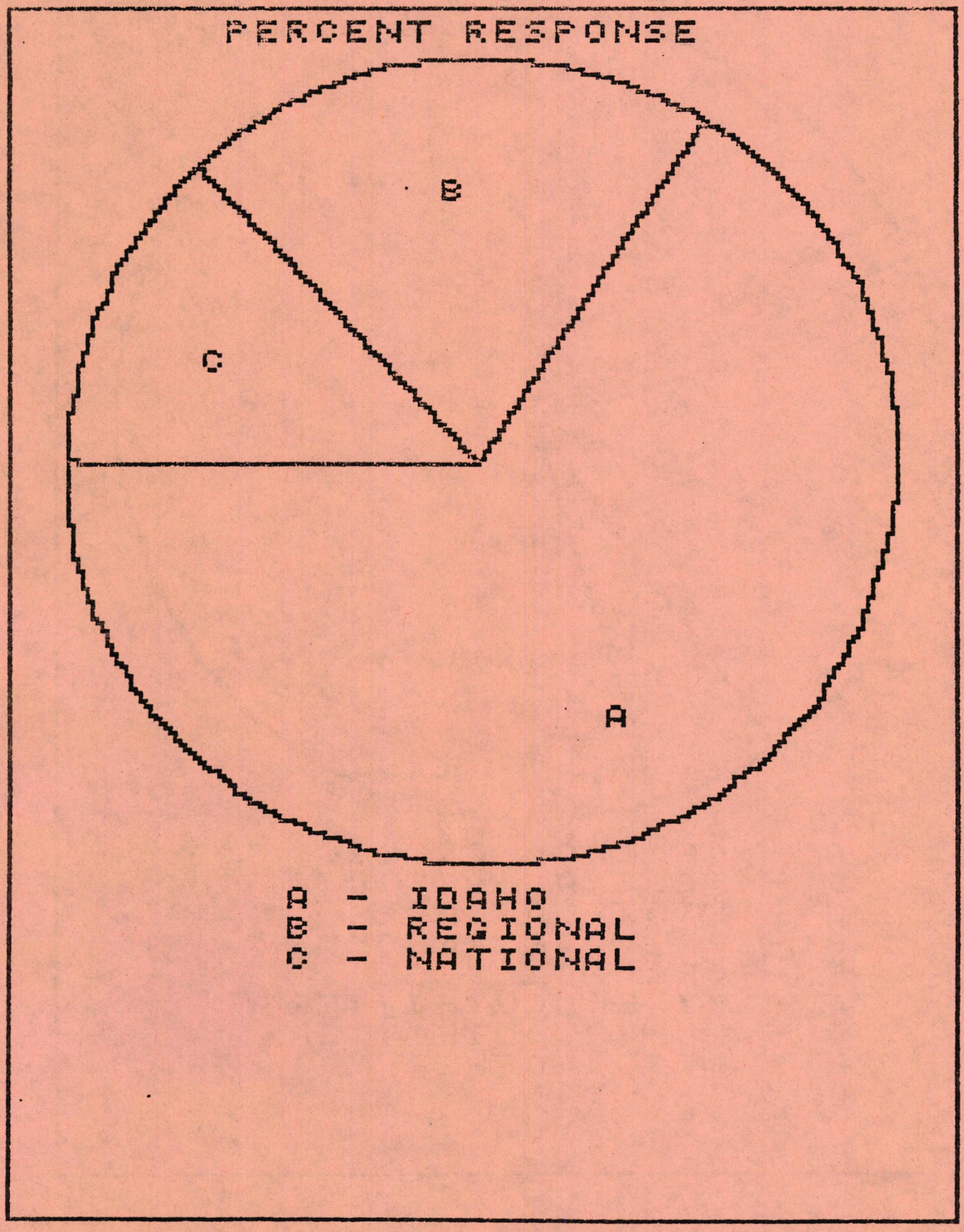
PIE GRAPHS

The three enclosed Pie Graphs illustrate:

1. The percent of support for each alternative
2. The percent of respondents by affiliation
3. The percent of respondents by geographic source or origin


RESPONSE PERCENT
D
E
A
C
B
A - ALTERNATIVE A
B - ALTERNATIVE B
C - ALTERNATIVE C
D - ALTERNATIVE D
E - NO ALTERNATIVE


PERCENT RESPONSE
A
B
C
D
E
F
G
H
A - GENERAL PUBLIC
B - FEDERAL OFFICIAL
C - STATE AGENCY
D - PRIVATE INHOLDER
E - ORGANIZATION
F - RIVER OUTFITTER
G - HUNT. OUTFITTER
H - MISC. OTHER


PERCENT RESPONSE
B
C
A
A - IDAHO
B - REGIONAL
C - NATIONAL

ATTACHMENT #1

ANALYSIS PROCEDURES

1. When received, each response was assigned a code number determined by the order in which it was received by the Wilderness Planning Team.

2. The affiliation of the respondents was identified, following a hyphen, by one of the following codes.

   1. = General Public
   2. = Federal Official
   3. = State Agency
   4. = Elected Official
   5. = Private Landowner
   6. = Interested Organization
   7. = River Outfitter
   8. = Hunting Outfitter
   9. = Other

3. Following another hyphen, the geographic source or origin was identified as follows:

   I = Idaho
   R = Regional (adjacent states)
   N = National (all others, including unknowns)

4. This three-part code (example, 15-9-R) was written on the upper, right-hand corner of the first page of the Response Sheets or letters by the Wilderness Planning Team.

5. The ten issues were each analyzed independently. After reading the comments on an issue, the responses were put into one of two opinion groups. These groups were determined by the content of the issue and the nature of the responses relative to that issue. Also included in the data for each issue were a "No Comment" and "Unable to Classify" column for each issue.

6. Each respondent was then listed under the alternative they stated was their preferred. Also listed under each alternative were supporting statements covering the range of reasons given for selecting a particular alternative. There was also a column for responses with no alternative selection.

FIRE MANAGEMENT
RESPONSE SHEET
CONCLUSION
REPORT

March 8, 1984

Prepared by: Tom Patten
Working Team Leader

Mike Oliver
North Group Leader

INTRODUCTION

The purpose of this report is to assign a weighted value and/or draw conclusions from the Response Analysis data. It is important to point out that the results are determined from the data base only, and do not consider the political attitude and/or present policy related to an issue unless reflected in a respondent's reply.

ISSUES AND ALTERNATIVES CONCLUSIONS

ISSUE #1. The effects of smoke from large fires on wilderness visitors, airstrips, private in-holdings, outfitters and guides, and adjacent airstrips.

Conclusions:

The respondent replies indicate that smoke from large fires is not a significant problem or concern. This is supported by an almost 4 to 1 majority and also the mix of affiliation and geographic source groupings represented within the majority. The results from this issue were not what was expected, considering the national emphasis on air quality; however, it should be noted that the issue was treated by both pro and con respondents as more of a question relative to just the wilderness rather than how smoke from large fires fits into the total air quality picture.

ISSUE #2. Protection from fire for private in-holdings and special-use permit areas.

Conclusions:

The respondents felt that it was an agency responsibility to protect private in-holdings; however, the majority was only about 1 to 1.5. It was interesting to note that there was such a large number of respondents who exhibited little support for those people fortunate enough to possess a wilderness in-holding. Example, it could be rather expensive to purchase fire insurance on a piece of real estate located in the middle of a prescribed fire management area, as several respondents suggested.

ISSUE #3. Public understanding, acceptance, and support for a prescribed fire program in the wilderness.

Conclusions:

The majority of replies, almost 10 to 1, and the mix of affiliation and geographic source groupings shows very strong public support for a prescribed fire program in the wilderness. As mentioned in the analysis, the respondents felt that this support needs to be reinforced with strong I&E programs designed for both in- and out-service.

ISSUE #4. Effects of fires on wildlife and their habitat.

Conclusions:

Wildlife can live with and benefit from fire was the consensus of an almost 10 to 1 majority of the respondents. This high support for the benefit side of this issue would seem to indicate that the general public has been exposed to an I&E program by wildlife agencies which expresses the theme stated by the respondent for the Idaho Department of Fish and Wildlife: "Few animals are actually lost in most fires and long-term population levels over a large area are not adversely affected. Overall changes will generally result in an improved diversity and richness of vegetation habitat and wildlife species."

ISSUE #5. Effects of fires on fish and their habitat.

Conclusions:

Although a small majority, less than 1 to 1.5, felt that fish and/or there habitat would benefit or not be adversely affected by fire, the stronger statements came from respondents on the other side of the issue. The respondent for the Idaho Department of Fish and Game was in this group. He wrote "Protection of watersheds critical for sensitive species should be planned for in consultation with the Idaho Department of Fish and Game." The large number of respondents who didn't reply on this issue (39.7%) might indicate people do not understand or are not as well informed about fish and their habitat as they are about wildlife.

ISSUE #6. Reasonable provisions for visitor safety.

Conclusions:

The majority of the respondents on both sides of the issue felt that some type of information system was needed to inform wilderness users of the potential for encountering a prescribed fire. The pivot point for the opposing views on this issue was based on how personal safety fits into a person's ideas and conceptions about "Wilderness Philosophy".

ISSUE #7. Unnaturally high fuel accumulations may exist due to past fire exclusions policies.

Conclusions:

A 7 to 1 majority felt that there was a strong possibility that unnatural fuel accumulations do exist in portions of the RONR Wilderness. Based on the comments, it is apparent that many of the respondents are not fully informed and knowledgeable on the concepts of ecosystem dynamics and fuel succession. They appear to have gleaned their comments directly from the Fact Sheet and may just reflect a concurrence with that information.

ISSUE #8. The threat to lands outside the wilderness from lightning fires that might be allowed to burn be contained within the wilderness when burning in high rate of spread fuel types on steep slopes in some parts of the wilderness.

Conclusions:

There appeared to be a high degree of misunderstanding and/or confusion among the respondents on this issue; however, the majority felt that fires should be handled on a case-by-case basis; but, should be confined within the wilderness boundaries.

ISSUE #9. Prescribed burning from planned ignitions may play a wilderness management role in the future.

Conclusions:

Two-thirds of the respondents favored the application of planned ignition prescribed fire in some form. This group is strongly divided into two factions; those who see planned fires role in wilderness as one of habitat improvement, hazard reduction, etc.; and, those who see planned fires role only as a restoration and/or maintenance tool. The respondents who were opposed to planned ignition view the issue from a pure wilderness standpoint, and they generally felt planned ignitions are not a natural process.

ISSUE #10. The wilderness may be stratified into meaningful fire management units so that site-specific prescriptions safeguard life and property and avoid serious smoke impacts, while furthering wilderness resource objectives.

Conclusions:

The majority of the respondents, 7 to 1, felt that the Forest Service could and/or should stratify the wilderness into meaningful management units, and that this process was necessary in any planning effort. A few of the respondents apparently got confused with the terminology used in the issue statement and concluded that it was just another excuse and way for the government to spend money.

ALTERNATIVES

A. Develop prescriptions allowing lightning fires (unplanned ignitions) to burn to achieve wilderness resource objectives. Suppress those fires that threaten life or property, or threaten to escape outside wilderness.

B. Suppression of all fires; no prescribed fire program.

C. Develop a program for using prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objective.

D. Develop a program emphasizing the use of prescribed fire, including both planned and unplanned (lightning) ignitions to achieve wilderness objectives. Human-caused unplanned ignitions will be treated as natural fires when all other prescription criteria are met.

Conclusions:

A program of prescribed fire, either planned or unplanned, was supported by all of the respondents who replied. There was, however, strong polarization between those favoring a program of planned plus natural ignition and those who favored a program of only natural ignition. This polarization was centered around peoples concepts about "Wilderness Philosophy" and where or if planned ignitions fit in that concept. The majority of the respondents, 3 to 1, supported a prescribed fire program which included planned ignitions. There were no respondents who supported a program of total fire suppression which indicates either people have become more educated about Fire Management then we realize or the Fact Sheet did a good job of making a case for prescribed fire.

REPORT SUMMARY

1. There were no patterns which could be determined in the way the different affiliations supported a particular issue, all ten issues, or the alternatives.

2. There were also no patterns in how a single issue, all ten issues, or the alternatives were supported by a particular response source area.

3. Many respondents addressed only the alternatives and/or one or two issues.

4. The respondents appear to show strong support for a prescribed fire program that depicts the beneficial side of prescribed fire.

5. The need for some type of in-service and out-service education on prescribed fire programs was a recurring theme throughout the analysis report.

Attachment II

FACT SHEET

August 25, 1983

FIRE MANAGEMENT PLANNING ALTERNATIVES
RIVER OF NO RETURN WILDERNESS

INTRODUCTION

The Intermountain Region and Northern Region have developed a cooperative agreement which will could lead to the development of a fire management plan for the River of No Return Wilderness. The primary goal of wilderness management is to maintain the area in as natural a condition as possible. This means that natural ecological processes should be perpetuated. This analysis highlights the fire situation in the wilderness, summarizes fire related issues and concerns, and describes fire management alternatives.

FIRE SITUATION

Fire effects have shaped the present state of the environment in the River of No Return Wilderness. Fire effects are not constant but dependent upon the complex interaction of a number of physical, biological, and human influences. Human influences resulting from past fire policy of aggressive fire suppression have caused significant impacts on the present fire situation in the Wilderness.

A policy of fast, energetic fire suppression has not excluded fire from the Wilderness. Lightning is still the predominant fire cause and lightning fires continue to occur at their historic average while person-caused ignitions are increasing in some areas of the Wilderness due to increased visitor use. Fire suppression has altered, with varying degrees of effectiveness, the potential for fire effects to run their "natural" course in the four broad fire ecology areas of the Wilderness:

1. River Breaks: Typically includes open pine and Douglas-fir stands, mountain grasslands, shrub dominated grasslands, and mountain mahogany on very steep slopes which make fire control efforts difficult and hazardous in many areas. Perennial grasses and forbs are the primary ground fuels, but there is enough needle litter and downfall to contribute significantly to the fuel loading. Fire's rate of spread is generally high with low to moderate resistance to control. Vegetative productivity and recovery is low to very good. This land group contains many of the high value areas (private land/structures, administrative sites, and big game winter ranges) which may influence fire management actions. The streams of this land group attract a major portion of the Wilderness visitors. Fires are frequent in open, grassy ponderosa pine. Fire history studies in the northern Rocky Mountains have indicated a fire interval of 10-15 years in these stands. Successful suppression of surface fires in these fire-maintained ponderosa pine stands over the last few decades has altered the sites towards dense thickets and an increased probability of crown fires.

2. Mid-Elevation Douglas-Fir: Primarily associated with Douglas-fir stands, but includes other short needle conifers. In general, the overstory consists of dense conifer stands with a heavy accumulation of litter and downed woody material. Stands may suffer insect, disease, and wind damage. Undergrowth is variable, but significant amounts of shrubs are usually restricted to openings. Slopes are steep and canyon bottoms are generally narrow. Fire rate of spread is moderate to high with moderate to high resistance to control. Vegetative productivity and recovery is generally moderate.

3. Mid-Elevation Lodgepole Pine: Typically consists of near-closed stands of lodgepole pine and associated short needle conifers. Topography is more gentle than the Douglas-fir group, even approaching a plateau-like character. Meadow openings are common. The understory is typically dwarf huckleberry, beargrass, and low shrubs. Ground fuels vary greatly from park-like areas to areas of moderate to heavy ground fuels. Fire rate of spread is generally moderate with a moderate to high resistance to control. Vegetative productivity and recovery is moderate to high.

4. Subalpine: Typically a mixed subalpine-fir, whitebark pine, and lodgepole pine vegetative community. Non-forested areas are common and often serve as barriers that restrict fire spread. Slopes are generally steep with low resistance to control. Vegetative productivity is low and recovery quite slow. This land group contains most of the high lakes and more spectacular visual areas of the Wilderness. As a result, its attraction to visitors is second only to the streams of the River Breaks land group.

One effect of fire suppression in the Subalpine, Mid-Elevation Lodgepole Pine, and Mid-Elevation Douglas-fir areas has been to decrease the occurrence of large fires. This will eventually cause unnaturally high percentages of these areas to change from a diversity of age classes and species, to a more even aged forest characterized by heavy, continuous fuel accumulations, a higher susceptibility to insect and disease mortality, and a greater probability of continuous crown fire. The extent to which this has occurred is dependent on the physical and biological factors specific to each area.

The combination of high rates of spread, rugged terrain, and remoteness in the River Breaks area produces more frequent, large fires here than in the other fire ecology areas, especially on south exposures. Fire suppression has been effective in confining the occurrence of these large fires to periods of severe fire behavior conditions. Fuel accumulations caused by fire exclusion policies probably have established higher fire intensity burning conditions today. Fires started by people near the river also have the potential to become large, intense fires, since the highest recreational use occurs during the main fire season. The result of frequent fires in the River Breaks has been to maintain a more diverse vegetative compostion relative to the other fire ecology areas.

The probability exists for a large fire originating in the River Breaks area to burn into forest stands of adjacent areas. This could result in a high intensity fire with the potential for causing large scale impacts. It is essential to manage the total fire situation in the River of No Return Wilderness, using the latitude contained in present policies and direction pertaining to Wilderness and Fire Management, to allow fire to play a more natural role in changing and shaping the present and future Wilderness environment.

ISSUES AND CONCERNS

We need your help in this planning effort. It's important that your thoughts aré considered and that your needs, as well as those of the land, are met. Following is a list of issues which have already been raised.

Each issue is followed by a short paragraph which provides some background information about the issue or explains why it is an issue. We'd like to hear what you have to say about these, plus any others you may wish to bring to our attention:

1. The effects of smoke from large fires on wilderness visitors, airstrips, private in-holdings, outfitters and guides, and adjacent airsheds.

Smoke in large quantities can impair visibility. Also, it could possibly pose a health hazard to visitors who already suffer from respiratory ailments. Smoke from the Mortar Creek wildfire in 1979 did restrict air traffic in the Middle Fork for a period of time. Smoke from lightning fires that might be allowed to burn to perpetuate natural ecosystems also has the potential to reduce visibility and affect health.

2. Protection from fire for private in-holdings and special use permit areas.

Wildfires and prescribed fires can threaten private property within the wilderness, especially in the highly flammable grass types. Precautionary fire suppression measures would be taken to protect all private property. Concerns for private property will require a continued policy of aggressive fire suppression in these areas.

3. Public understanding, acceptance, and support for a prescribed fire program in wilderness.

For decades it has been accepted that all wildland fires are bad. A policy which allows prescribed fires to burn could be confusing and appear contradictory to the public. This may reduce the effectiveness of fire prevention efforts. The theme of fire prevention, however, always has been to prevent unwanted fires. Properly and carefully used, fire has been recognized as a valuable tool for a long time. Wildland fires have been an integral part of this wilderness for thousands of years.

4. Effects of fires on wildlife and their habitat.

Wildland fires generally result in an improvement of food, cover, and distribution for most species of wildlife, because they create a patchwork-like diversity in vegetation. Sources of food and cover for some species of wildlife, however, may be reduced, or even temporarily lost. Some populations, or portions of them, may be displaced for varying periods of time. Although individual animals occasionally will be injured or killed, most escape from fires. Others find refuge in holes or rock piles. Wildlife and vegetation in this area, however, have evolved with fires over long periods of time and are adapted to the cyclic occurrence of fire in these ecosystems.

5. Effects of fires on fish and their habitat.

Fire impacts on a stream and the aquatic life depend on a number of variables which include: season and intensity of the fire, stream size and gradient, soil type and depth, and amount and pattern of precipitation. Depending on the combination of variables, fire can increase suspended sediments, raise water temperature, decrease organic litter influx, raise primary production, and cause fluctuations in benthic invertebrates.

Fires of high intensity burning over a major portion of a small watershed can elevate water temperature to a lethal level. Excessive amounts of large debris in the form of dead trees, or portions of them, can be deposited in a stream and become effective barriers to fish migration. High intensity fires, especially on granitic watersheds, can induce sedimentation rates which will smother eggs and alevins in redds. Also, extreme sedimentation can fill in rearing areas with reduced stream carrying capacity a result. Both resident and anadromous fish in the wilderness streams have maintained populations under the natural occurrence of fire.

6. Reasonable provisions for visitor safety.

There is always the chance that wilderness visitors may come in contact with a wildfire or prescribed fire. If visitors were not aware of the fire or of what to do while near it, serious personal injury could occur. Adequate safety measures require that agency personnel carefully inform visitors regarding fire hazards and survival procedures through direct contacts, trailhead signing, brochures, and the media.

7. Unnaturally high fuel accumulations may exist due to past fire exclusion policies.

Wildland fires consume grass, needles, dead twigs, branches, logs, and other fuels. Generally, the more fuels there are the higher the fire intensity and the greater the effects of the fire on the ecosystem. Periodic burning reduces the amount of fuels for future fires and thereby decreases fire intensity.

Successful fire suppression over the past 50 years has contributed to accelerated fuel accumulations on those sites where the fire return interval is frequent, like the River Breaks. In areas where the fire return interval is longer, every 50 to 100 years (higher elevation and north slope forests), fuel accumulation probably may not have been affected in a significant manner by fire suppression activities.

8. The threat to lands outside the wilderness from lightning fires that might be allowed to burn within the wilderness when burning in high rate of spread fuel types on steep slopes in some parts of the wilderness.

Fires burning in cured grass on steep, south slopes may threaten resource values and property outside wilderness under some situations. Fire management prescriptions will be developed to handle site-specific situations and concerns.

9. Prescribed burning from planned ignitions may play a wilderness management role in the future.

Present Forest Service policy permits only lightning fires (unplanned ignitions) to serve as prescribed fires under plans approved by Regional Foresters to meet wilderness management objectives. New considerations may permit some prescribed fires from planned ignitions in the future. These would be fires deliberately ignited by Forest Service personnel to perpetuate the wilderness resource. The proposal that would allow planned ignitions in wilderness would require written justification and approval on a case-by-case basis.

10. The wilderness may be stratified into meaningful fire management units so that site specific prescriptions safeguard life and property and avoid serious smoke impacts, while furthering wilderness resource objectives.

"Lightning-caused fires are allowed to burn in designated zones within 16 areas managed by the National Park Service and in 18 Forest Service Wildernesses. Nearly 7 million acres of parks and 9 million acres of

forests are included in such zones. Since the beginning of these programs, more than 1,200 lightning-caused fires have been allowed to burn about 190,000 acres of National Parks and National Forests." 1/

Detailed and site specific fire management plans provide the basis for decision-making and administering an extensive prescribed fire program in wildernesses. Life and property have been safeguarded effectively and generally there have not been prolonged and serious smoke episodes.

FIRE MANAGEMENT ACTION ALTERNATIVES

Effective fire suppression efforts over the past 50 years have altered substantially the effects of fire on wilderness ecosystems. Immediate suppression actions still are taken today on all fires occurring in the area. A new fire management plan could provide that certain fires would be allowed to resume their natural role in a wilderness environment. These fires would be allowed to burn in predetermined areas under carefully prescribed conditions. Unwanted fires which pose an unacceptable threat to resources, property, or public safety would continue to be suppressed. There are basically four distinct fire management alternatives that could be administered in the wilderness:

1/ Kilgore, Bruce M. 1982. Fire management programs in National Parks and Wilderness.. Paper presented at the Intermountain Fire Council and Rocky Mountain Fire Council Meeting, Jackson, Wyoming.

APPENDIX

C

ECONOMIC ANALYSIS

James M. Saveland

ABSTRACT

The objectives of this paper are to: a) discuss the problems involved in an economic analysis for wilderness fire management, b) compare the costs and area burned for four alternative fire management strategies, c) describe how each strategy affects the risk of a catastrophic fire, and d) discuss long-run ecological consequences and irreversible impacts. A cost/benefit analysis is used where expected burned area compared to the natural fire regimes is the measure of benefit. Decision analysis is used to compare the relative costs and area burned of four different fire management strategies: 1) Forest Service policy before 1978, where control was the only appropriate suppression response; 2) current policy prior to an approved plan, characterized by use of the Escaped Fire Situation Analysis (EFSA), where control, contain, and confine are appropriate suppression responses; 3) current policy augmented by an approved plan for unplanned ignition prescribed fires; and 4) current policy augmented by an approved plan for planned and unplanned ignition prescribed fires. Strategy 1 resulted in costs of $421 per burned acre, strategy 2 in $118 per burned acre, strategy 3 in $52 per burned acre, and strategy 4 in $35 per burned acre.

INTRODUCTION

The Frank Church--River of No Return (FCRONR) Wilderness was established July 23, 1980 by PL 96-312. The area encompasses 2.35 million acres in central Idaho and is administered by six national forests in two different regions of the Forest Service. Special provisions are made in the act for mining, aircraft landing, grazing, small hydro-electric generators, and cultural resources. There are 74 parcels of non-federal land occupying 10,000 acres within the wilderness. In addition, there are 114 bridges in or adjacent the wilderness and 58 administrative sites that require protection. The Middle fork and main Salmon are two of America's premier white water rivers, each attracting some 8,000 floaters every year. There are 24 active airstrips with 4,400 aircraft landings each year. The FCRONR Wilderness includes a variety of environments from the steep, hot, dry, Salmon River Break country to cool, moist, high elevation subalpine communities.

Fire management policy on National Forest System lands is to plan and execute fire management programs to minimize the sum of fire program costs plus the net value change due to fire, consistent with land and resource management objectives (U.S.D.A. Forest Service 1984). The purpose of this paper is to provide economic information to decision makers. The economic information is but one portion of the decision matrix. It assists in problem definition, in specification of objectives, and showing the economic tradeoffs associated with different decisions. The objectives of this paper are to:

A) Discuss the problems involved in an economic analysis for wilderness fire management.

B) Compare the costs and area burned for four alternative fire management strategies.

C) Describe how each strategy affects the risk of a catastrophic wildfire.

D) Discuss long run ecological consequences and irreversible impacts.

WILDERNESS VALUE PROBLEM

Several economic techniques have been used to evaluate fire management programs (Baumgartner and Simard 1982; Gorte and Gorte 1979; Simard 1976). Most economic analysis of fire management programs today are based on minimizing cost plus net value change. Quantifying the change in wilderness resource value presents a major problem. A value can be attached to the set of goods and services that wilderness provides, for example: range, recreation, wildlife, water, mining, structures, etc. (Condon 1985; Mills 1985). Yet, for the most part, these values are for non-conforming uses that are a minor by-product of wilderness and do not recognize wilderness as a resource of and by itself. Althaus and Mills (1982) use recreation visitor-days as the unit of measurement for value change in wilderness. But the wilderness resource is not synonomous with the recreation resource. The value of the wilderness resource (a place where the forces of nature dominate and man is a visitor) to date has defied measurement.

Opportunity cost (the value foregone by investing in one resource instead of another) can be used to place a value on a good or service. A wilderness area must be worth at least as much as the value of the timber within it. However, opportunity cost always undervalues the resource to a greater or lesser extent. In addition, if a fire burns a portion of a wilderness, the fire's effect on the value as a wilderness is totally unrelated to the fire's effect on the timber values (Chandler and others 1983).

Because of these problems, very little has been written about wilderness fire management economics. Some exceptions are the economic analysis for the Lassen Fire Management Plan (Condon 1985), the economic analysis for the environmental assessment of the Gospel-Hump Wilderness fire management policy (Lukens and Saveland 1984), the economic discussion in the Selway Bitterroot Wilderness fire management environmental impact statement (U.S.D.A. Forest Service 1976), cost effective fire management in national parks (Agee 1985), and criteria for evaluating the economic efficiency of fire management programs in park and wilderness areas (Mills 1985).

To circumvent the value problem, a cost/benefit analysis is used for this paper. The management objective for wilderness is to allow the forces of nature to operate unrestrained as much as possible. Plant communities require a certain amount of fire, just as they require a certain amount of precipitation. Thus, the average annual number of acres burned by fire is the measure of benefit. The closer the number of burned acres is to the historic (what fire history studies reveal) or "natural condition", the greater the benefit. Altering the average annual burned area would be like altering the average annual rainfall.

DECISION ANALYSIS

Decision analysis is used to compare the relative costs and area burned for four different fire management strategies. Strategy 1 is the Forest Service policy prior to 1978, where control is the only appropriate suppression response. Strategy 2 is the current Forest Service policy prior to an approved plan, characterized by use of the Escaped Fire Situation Analysis (EFSA), where control, contain, and confine are appropriate suppression responses. Strategy 3 is the current policy augmented by an approved plan for unplanned ignition prescribed fires. Strategy 4 is the current policy augmented by an approved plan for unplanned and planned ignition prescribed fires. The decision trees generate average annual costs and average annual acres burned.

Most factors affecting wildland fire are extremely variable. Thus the absolute values generated have little utility as expected values, yet the relative values are useful for making comparisons which may aid decision making.

Decision analysis is a systematic approach for evaluating management alternatives when faced with uncertain future events. The decision trees readily show which variables are the most important in determining the results. Decision analysis has been applied to several other problems in wildland fire management (Hirsch and others 1981; Radloff 1984; Seaver and others 1983). Decision trees for the 4 strategies are given in appendix I.

The first branch of the decision tree divides fires into lightning and person caused. Fire occurrence records for the period 1960-1983 indicate that 88% of the fires in the FCRONR Wilderness are caused by lightning (Table 1). The remaining 12% are person caused fires. It is assumed that all person caused fires will be considered a wildfire and require an appropriate suppression response.

Table 1. Summary of Frank Church--River of No Return Fire Occurrence (1960 - 1983).

Cause	Size Class							
	A	B	C	D	E	F	G	Total
Lightning	1491	296	44	5	2	5	2	1845 (.88)
Person	188	49	11	4	1	1	2	256 (.12)
	1679	345	55	9	3	6	4	2101

The lightning fire branch is divided into prescribed fire and wildfire. Strategies 1 and 2 do not have prescribed lightning fires. For strategies 3 and 4, a percentage of fires were presumed to have been allowed to burn under prescription. At the time of this analysis, prescriptions were still being developed. Historically, large fires in the FCRONR Wilderness occur during periods of high fire danger, a time when fires are most likely to be out of prescription. Thus more small size class fires would meet prescribed fire criteria than the large size class fires. It is assumed that the judicious use of planned ignitions will create conditions to allow for more unplanned ignition prescribed fires. For strategy 3, 30% of the class A, 15% of the class B, 5% of the class C, 2% of the class D/E, and 1% of the class F/G lightning fires were assumed to become prescription fires. When these percentages were applied to the fire occurrence record, a total of 27% of the lightning fires would be prescribed fires while 73% would be wildfires. For strategy 4, 40% of the class A, 25% of the class B, 10% of the class C, 4% of the class D/E, and 3% of the class F/G lightning fires were assumed to become prescription fires. When these percentages were applied to the fire occurrence record, a total of 37% of the lightning fires would be prescribed fires, while 63% would be wildfires.

For comparison purposes, the nearby Moose Creek District portion of the Selway-Bitterroot Wilderness has been functioning under an approved fire

management plan since August 7, 1978. From 1978 through 1983, 48 of the 148 lightning fires or 32% have been unplanned ignition prescribed fires (Saveland and Hildner 1985). From July 1972 through 1983, 50 of 70 fires or 72% have been unplanned ignition prescribed fires on the Bitterroot National Forest portion of the Selway-Bitterroot Wilderness.

Probabilities of the different size class fires for strategies 1 and 2 were determined from the fire occurrence record. For strategies 3 and 4, after the percentage of prescribed fires were subtracted from the fire occurrence record, the remainder determined the probability distribution of the different size class fires in the wildfire branch. The probabilities of the different size class fires in the prescribed fire branch were subjectively estimated to be: class A - 70%, class B - 15%, class C - 11%, class D/E - 2%, class F/G - 2%.

The average size of the different size class fires for strategy 1 was determined from fire occurrence records: class A - .1 acre, class B - 2 acres, class C - 32 acres, class D/E - 362 acres, class F/G - 10,047 acres. Due to the EFSA used in strategies 2,3, and 4, it was assumed that the average size of class D/E fires would increase by a factor of 2 for an average size of 724 acres, and class F/G fires would increase by a factor of 1.5 for an average size of 15,070 acres. The average size of prescribed fires for strategies 3 and 4 were subjectively estimated: class A - .1 acre, class B - 2 acres, class C - 40 acres, class D/E - 750 acres, class F/G - 18,000 acres.

Each of the six national forests that administer the FCRONR Wilderness submitted their average suppression costs by size class, which were then weighted according to their percentage of fires in each size class from the fire occurrence records. Wildfire expenditures only include variable costs associated with actual suppression activities. The fact that fixed costs such as presuppression and overhead are left out may bias the results toward the high cost alternative if fire management productivity is held constant across all four alternatives. The costs for strategy 1 wildfires rounded to the nearest thousand and in 1984 dollars are: class A - $2,000 per fire, class B - $5,000 per fire, class C - $37,000 per fire (based on $1156 per acre for average 32 acre fire), class D/E - $298,000 per fire (based on $797 per acre for average 362 acre fire), class F/G - $3,466,000 per fire (based on $345 per acre for average 10,047 acre fire). Compared to the results of Gonzalez-Caban and others (1984) these estimated costs may be conservative.

Strategies 2,3, and 4 incorporate the change in costs due to the revised policy allowing appropriate suppression response and use of the EFSA. The per acre costs are assumed to be reduced to $100 per acre for class D/E fires and $75 per acre for class F/G fires. For comparison purposes, costs on two escaped Class E fires on the Bitterroot National Forest portion of the Selway-Bitterroot Wilderness were $85 per acre.

Average costs of monitoring prescribed fires for strategies 3 and 4 were assumed to be $250 per fire for A,B, and C class fires. This is the average cost of monitoring unplanned ignition prescribed fires on the Moose Creek Ranger District portion of the Selway-Bitterroot Wilderness. Condon (1985)

arrived at a similar figure. Average costs for class D/E prescribed fires was subjectively estimated at $1,000 per fire and class F/G fires at $10,000 per fire.

Strategy 4 includes the use of planned ignition prescribed fires in addition to the decision tree. Costs are assumed to be $10 per acre. Most of the prescribed burning from planned ignitions is assumed to take place in ponderosa pine community types. Similar burning conducted by the BLM and Challis National Forest has resulted in average costs of $10 per acre.

The decision analysis computes an expected burned area per fire and an expected cost per fire. It should be reemphasized that due to the above estimation procedures and extreme variability, the absolute values have little utility as expected values, yet the relative values are useful for making comparisons. To give an idea of the variability involved, in the period from 1960 to 1983, the least expensive fire year was 1982 when 35 fires burned about 20 acres and cost about $82,000. The worst year was 1979 when 123 fires burned a total of 77,000 acres, cost approximately $27.4 million, and one firefighter was killed. The area can have even higher fire occurrence, as 2,000 fires occurred in 3 days in 1940 in what was then the Idaho Primitive and Selway Wilderness Areas (Thompson 1964).

Table 2 compares the costs and area burned of the four different strategies. Also included in Table 2 is an estimate of the historic (before suppression) average area burned per year. For the FCRONR Wilderness, it is assumed that the long term average area burned per year is 1 - 2% of the total area. Of course there would be great variability from year to year. The area can be calculated by determining the number of acres of plant communities with a similar fire regime, dividing the number of acres by the fire cycle, and summing. For example, suppose an area consisted of 10,000 acres of ponderosa pine with a fire cycle of 15 years and 20,000 acres of western redcedar with a fire cycle of 300 years. The historic average annual burned area would be:

$$\frac{10{,}000 \text{ ac}}{15 \text{ yr}} + \frac{20{,}000 \text{ ac}}{300 \text{ yr}} = 733 \text{ ac/yr} \qquad \frac{733 \text{ ac/yr}}{30{,}000 \text{ ac}} \times 100\% = 2.4\%/\text{yr}$$

Actual fire cycles have not been computed for the entire FCRONR Wilderness. For 235,000 acres of ponderosa pine dominated communities along the Salmon River Breaks, the historic average annual burned area was calculated to be 12,256 acres per year (5%). For comparison, the adjacent Gospel-Hump Wilderness historic average annual burned area was calculated to be 2-3% per year and the adjacent Selway-Bitterroot Wilderness to be approximately 1% per year. If all lightning fires are allowed to burn in the decision tree (change lightning prescribed fire probability to 1.0 and wildfire probability to 0.0), the resulting area burned would be 334.19 ac/fire for 29,255 ac/year (1.2%).

Table 2 shows the tremendous cost savings that can be realized by effectively implementing the current fire policy and the Escaped Fire Situation Analysis. Costs per acre are reduced by more than one-half, from $0.83 per acre of wilderness to $0.35 per acre of wilderness. This reflects the fact that large fires with a low probability of occurrence account for the bulk of average annual costs. The average cost per fire of large fires decrease as a result of not always having to commit large amounts of expensive suppression resources to remote areas. Savings can be realized by reducing the costs of

large fire suppression through an appropriate suppression response and EFSA or by reducing the probability of large fire occurrence (Lukens and Saveland 1984).

Strategy 4, the current policy augmented by unplanned and planned ignition prescribed fires, comes closest to the historic level of average annual burned acres. Strategy 4 is the most economically efficient, costing $35 per burned acre. However, Strategy 4 requires an investment of $50,000 each year in a planned ignition program. Because of savings in allowing for more unplanned prescribed fires, the net increase in program costs is about $43,000. The question for the decision maker becomes: is increasing the number of average annual burned acres from 14,532 to the lower limit of the historic level worth $43,000 a year?

Table 2. Relative cost comparison of four different fire management strategies and the resulting amount of area burned.

	Avg. Annual Costs[1] ($/yr)	Costs per Acre[2] ($/ac)	Avg. Annual Burned Area[1] (ac/yr)	Burned Area as a Percent of Total area %	Avg. Annual Costs per Burned Ac ($/ac)
Historic (Before suppression)			23,000-47,000	1 - 2	
Strategy 1 (Fire Mgt. Prior to 1978)	1,951,354	0.83	4,640	.20	421
Strategy 2 (Current Fire Policy)	824,627	0.35	7,003	.30	118
Strategy 3 (Unplanned Ignitions)	751,181	0.32	14,532	.62	52
Strategy 4 (Unplanned and Planned Ignitions)[3]	794,178	0.34	22,596	.96	35

[1]Based on mean of 87.54 fires per year.
[2]Based on 2.35 million acres in the Frank Church-River of No Return Wilderness.
[3]Includes 5,000 acres burned each year by scheduled ignitions at $10 per acre.

RISK

Risk can be defined as the potential for realization of unwanted, negative consequences (Rowe 1977). There is a certain level of risk associated with each fire management strategy. The major risk involved is the probability of a catastrophic wildfire (catastrophic wildfire defined as a fire of any size with one or more of the following characteristics: excessive resource damage,

Risk can be defined as the potential for realization of unwanted, negative consequences (Rowe 1977). There is a certain level of risk associated with each fire management strategy. The major risk involved is the probability of a catastrophic wildfire (catastrophic wildfire defined as a fire of any size with one or more of the following characteristics: excessive resource damage, excessive suppression costs, excessive damage to private inholdings, or the loss of life). The catastrophic wildfire can have 3 origins: 1) a wildfire that escapes initial attack and becomes catastrophic, 2) an unplanned ignition prescribed fire that escapes prescription and becomes a catastrophic wildfire, or 3) a planned ignition prescribed fire that escapes prescription and becomes a catastrophic wildfire. A large fire is not necessarily a catastrophic wildfire and all fires that escape prescription are not necessarily catastrophic. Although the probabilities involved are small, even a very low probability of a very high cost can be a significant cost factor (Zivnuska 1968, 1972).

Figure 1 shows the general relationships of a risk cost-benefit model (Rowe 1977). As expenditures are made in fire management (direct losses), risk of catastrophic fire (indirect losses) is reduced and benefits (gains) are

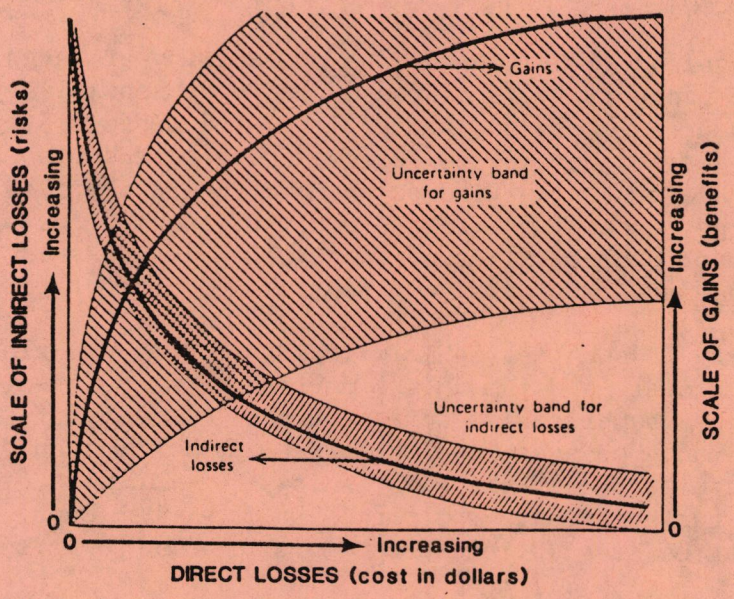


Figure 1. Risk Cost/Benefit Model (Rowe 1977).

increased. Due to uncertainty, the optimal solution lies somewhere in the area where the shading overlaps. A family of curves representing various strategies could be constructed. For strategy 1, the benefits of fire suppression in wilderness areas are minimal, the direct losses are high, and the risk reduction is questionable. On the one hand some potential catastrophic fires may be suppressed before they become disastrous. But on the other hand, fuel continuity and fuel loading may increase over time, thereby increasing the probability and/or magnitude of a catastrophic fire event. For strategy 2, the benefits are increased over strategy 1, direct losses are not as high, and the risk of catastrophic fire is less. The assumption is made that increased

learning period, the probability of an unplanned fire escaping prescription and becoming catastrophic should drop to a very low level. Strategy 4, by incorporating unplanned and planned ignitions, increases the benefit over strategy 3, further reduces the probability of a catastrophic wildfire to its lowest level, but increases the direct losses over strategy 3. Again, there is the probability of a planned ignition escaping prescription to become a catastrophic wildfire. The prescriptions should ensure that the probability of escape is even lower than unplanned prescribed fire escapes. There is also a learning period here, after which the probability of escape is minimized. That knowledge acquired during the learning period should also have benefits that can be transferred and applied to forest areas outside of wilderness, e.g. summer burning without constructed handline, advances in knowledge of fire behavior in natural fuels, controlled crown fires, etc. If the long term goal is to minimize the risk of catastrophic fire, Strategy 4 would appear to satisfy the objective best. However, there are costs (direct losses) associated with reducing the risk. If net present costs through an infinite time span are determined, the high initial costs associated with strategy 4 may never be offset due to the properties of discounting. Whether or not it would be profitable to invest funds in planned ignitions to reduce the probability and/or magnitude of a catastrophic fire event depends on the initial probability of a catastrophic wildfire, the amount the probability is decreased, and the amount of money spent to decrease the probability.

Lukens and Saveland (1984) showed the probability of large costly fires and the amount the probability is decreased are very sensitive variables. They also found that in areas where the probability of a large costly fire is small to begin with, prescribed burning to further decrease the probability would not be justified. In areas of high fire occurrence, where there is a high probability of large, expensive fires, prescribed burning could be cost effective. The Frank Church--River of No Return Wilderness is a relatively high fire occurrence area with a high potential for large fires.

The probability of a catastrophic wildfire varies from place to place based on the fire climate and the values at risk. In one area a relatively small investment may dramatically decrease the probability of catastrophic wildfire, while in another area, even a large expenditure would not have much effect on the probability. If the risk is low to begin with, it would not be cost effective to further reduce the risk. On the other hand, a considerable amount of money may be saved by accepting more risk in low risk areas.

IRREVERSIBLE IMPACTS

Radical departures from the historic long term average annual burned area can be expected to produce irreversible impacts, just as converting an area from an average of 80" of rainfall a year to an average of 10" of rainfall a year would be expected to produce long run ecological consequences. An analogy can be drawn between Fisher and Krutilla's (1974) example of directing water from the Everglades and continued fire suppression activities. In addition, continued suppression activities can set the stage for a stand replacement fire in a community that is adapted to periodic surface fires, possibly preventing the re-creation of a plant association similar to the one which now exists. A conservative policy with respect to irreversible modification of the environment or decisions that have long run welfare losses that may be eventually retrieved is indicated (Fisher and Krutilla 1974).

In areas where unplanned ignitions are severly constrained, planned ignitions may be necessary to prevent the long run ecological consequences of continued suppression. As an example, consider an ecosystem that is dependent on periodic stand replacement fires, such as certain lodgepole pine

communities. If man had not interceded by putting fires out, the natural state would be characterized by a negative exponential age-class distribution at the landscape level with the mean of the distribution equaling the fire cycle (Van Wagner 1978, Van Wagner and Methven 1980). By putting fires out, the age-class distribution has changed. By allowing stand replacement fires back into the system, the process through time would converge back to a negative exponential distribution. If unplanned ignitions are constrained, it will take longer to reach a negative exponential distribution and the mean of the distribution (fire cycle) would be greater than the original. If fire is continually suppressed, there is the possibility of these ecosystems being drastically altered or replaced by others.

The use of planned ignitions brings up the question of authenticity. Fisher and Krutilla's (1974) analogy between the demand for undisturbed natural areas and the demand for authenticity in the visual arts points out the highly inelastic demand for the "originals." Under this analogy, a landscape sculptured by unplanned ignitions could be considered an original work of art, while a landscape sculptured by planned ignitions would be an exact forgery. Unfortunately, all of the "originals" may have been "destroyed" or "damaged" by suppression activities. Gruell (1983) presents a dramatic photo record of how suppression activities have affected various communities.

SUMMARY

Wilderness fire management presents several problems for an economic analysis. Because of the problems of value change in wilderness, a cost/benefit analysis was developed. Average annual burned acres and average annual costs were determined using decision analysis. Average annual burned acres as compared to the historic level is a measure of benefit. This method can signal when a planned ignition prescribed fire program should be considered. If there are few management constraints, burned area resulting from unplanned ignitions will closely approximate the historic level and a planned ignition program is unnecessary. If constraints on unplanned ignitions are binding, thus requiring a lot of suppression activity, a planned ignition program should be considered to maintain historic burned area levels.

Several assumptions and subjective estimates were necessary to complete the decision trees. Guidelines for making assumptions and subjective estimates included: make as few as possible, be consistent, be conservative, check against adjacent wilderness areas if possible, break down major assumptions into more manageable ones, and receive input and feedback from the district fire management officers. The estimates for the rare event larger size class fires account for the majority of costs and area burned, and so greatly influence the results. Thus extensive encoding procedures such as those outlined by Selvidge (1975) and Spetzler and Stael Von Holstein (1975) would be appropriate to attempt to come up with more accurate estimates.

Further research is necessary in several areas to reduce the levels of uncertainty. Most fire history studies concentrate on fire scar analysis, yet there is a pressing need for age-class analysis at the landscape level to determine fire cycles for all communities. The subject of risk management as it relates to fire is in its infancy. Probabilities of rare, costly fire events need to be determined. How our management actions affect the probability and magnitude of those costly rare events could have large payoffs. As an escaped fire situation analysis is performed on more fires, a data base needs to be established to document cost savings and the resulting increase in area burned. The size class probability distribution of fires which are allowed to burn needs to be determined. In general, as experience is gained in

fire management for the FCRONRW, a data base can be built to more accurately determine the values that were subjectively estimated.

The results indicate that the greatest cost difference was between strategy 1 and strategy 2. The cost differences between strategies 2,3, and 4 may not be significant. The burned acres resulting from strategy 4 comes closest to the historic level. If planned ignitions are used in an attempt to match the historical level, quality of burned acres must also be considered along with quantity. In other words, if the historical level resulted from lightning fires in August, planned ignitions in May would not have the same effect. Strategy 4 also results in the lowest costs per burned acre. Each strategy will affect the risk of a catastrophic wildfire event. Strategy 4 would reduce the probability and/or magnitude of a catastrophic wildfire to a minimum level. The main question remains: are the increased benefits and reduction in risk of catastrophic wildfire worth the expenditure of funds for a planned ignition program to augment unplanned ignition prescribed fires and wildfire suppression?

Each strategy, by affecting the natural fire regime, may also have long run ecological consequences and/or irreversible impacts. A conservative policy (i.e. not drastically altering the natural fire regime) to prevent irreversible modification of the environment or decisions that have long run welfare losses that may be eventually retrieved is recommended. The use of planned ignitions brings up the question of authenticity. Analogous to the highly inelastic demand for originals in the visual arts, a landscape sculptured by unplanned ignitions could be considered an original work of art, while a landscape sculptured by planned ignitions would be an exact forgery. Unfortunately, all of the "originals" may have already been "destroyed" or "damaged" by suppression activities.

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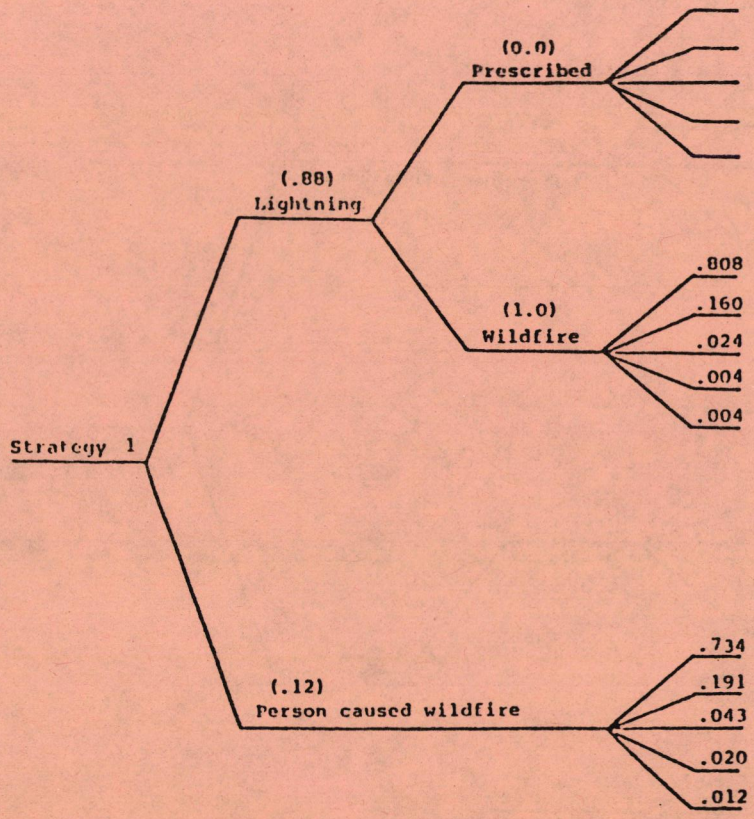
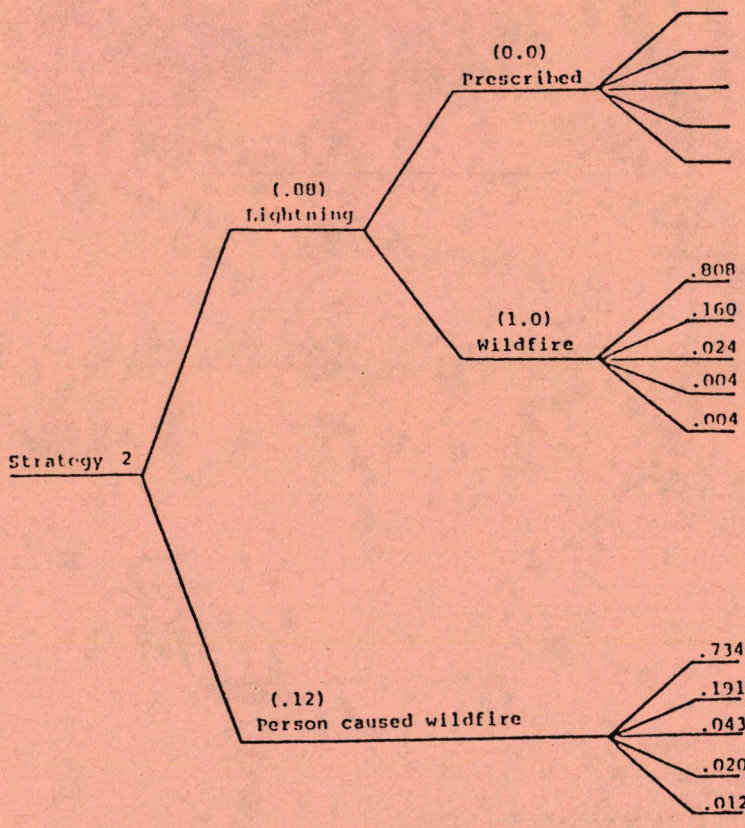


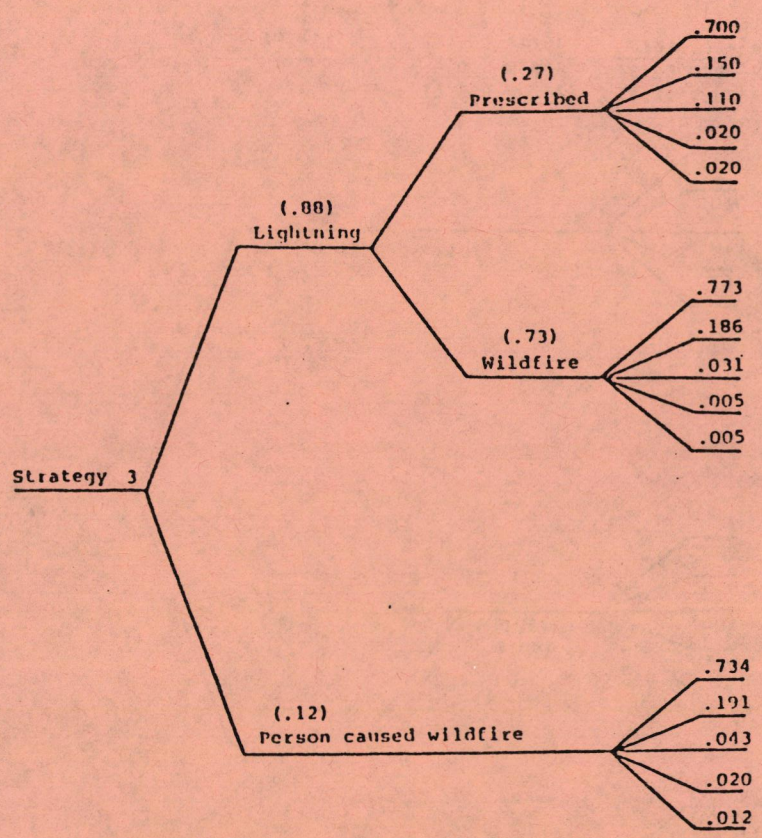
	Avg. Size (acres)	Expected burned area per fire (acres)	Avg. Cost ($)	Expected cost per fire ($)
.808	0.1	.07	2,000	1,422
.160	2	.28	5,000	704
.024	32	.68	37,000	781
.004	362	1.27	289,000	1,017
.004	10,047	35.37	3,466,000	12,200
.734	0.1	.01	2,000	176
.191	2	.05	5,000	115
.043	32	.17	37,000	191
.020	362	.87	289,000	694
.012	10,047	14.47 / 53 ac/fire	3,466,000	4,991 / $22,291/fire

$$\frac{\$22,291/\text{fire}}{53\ \text{ac/fire}} = \$421/\text{ac}$$



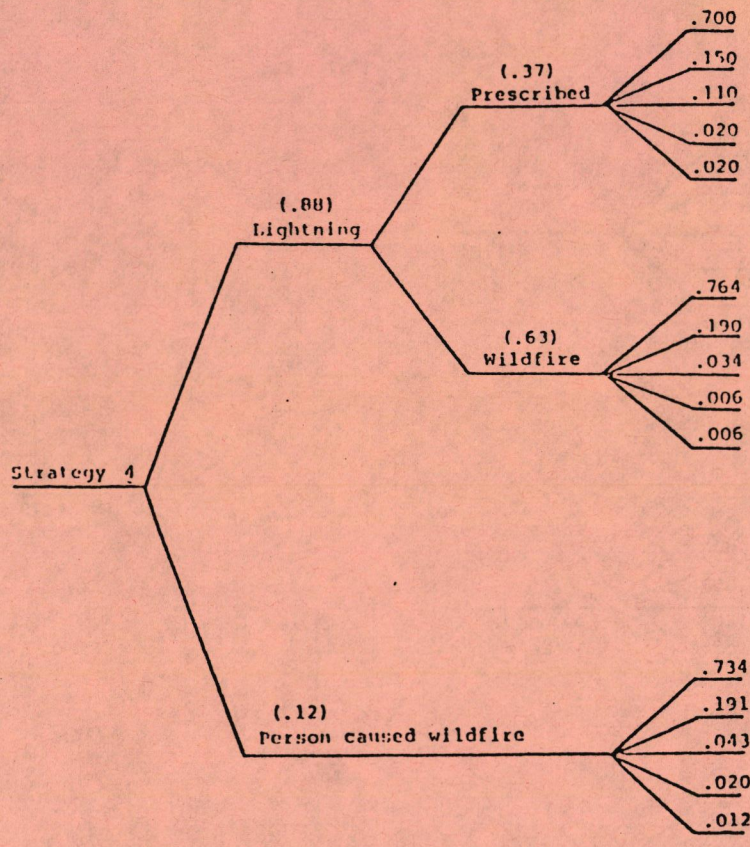
	Avg. Size (acres)	Expected burned area per fire (acres)	Avg. Cost ($)	Expected cost per fire ($)
.808	0.1	.07	2,000	1,422
.160	2	.28	5,000	704
.024	32	.63	37,000	781
.004	724	2.55	72,000	253
.004	15,070	53.05	1,130,000	3,978
.734	0.1	.01	2,000	176
.191	2	.05	5,000	115
.043	32	.15	37,000	191
.020	724	1.74	72,000	173
.012	15,070	21.70 / 80 ac/fire	1,130,000	1,627 / $9,420/fire

$$\frac{\$9,420/\text{fire}}{80\ \text{ac/fire}} = \$118/\text{ac}$$



	Avg. Size (acres)	Expected burned area per fire (acres)	Avg. Cost ($)	Expected cost per fire ($)
.700	0.1	.02	250	42
.150	2	.07	250	9
.110	40	1.05	250	7
.020	750	3.56	1,000	5
.020	18,000	85.54	10,000	48
.773	0.1	.05	2,000	993
.186	2	.24	5,000	597
.031	32	.64	37,000	737
.005	724	2.33	72,000	231
.005	15,070	48.40	1,130,000	3,630
.734	0.1	.01	2,000	176
.191	2	.05	5,000	115
.043	32	.15	37,000	191
.020	724	1.74	72,000	173
.012	15,070	$\frac{21.70}{166 \text{ ac/fire}}$	1,130,000	$\frac{1,627}{\$8,581/\text{fire}}$

$$\frac{\$8,581/\text{fire}}{166 \text{ ac/fire}} = \$52/\text{ac}$$



	Avg. Size (acres)	Expected burned area per fire (acres)	Avg. Cost ($)	Expected cost per fire ($)
.700	0.1	.02	250	57
.150	2	.10	250	12
.110	40	1.43	250	9
.020	750	4.88	1,000	7
.020	18,000	117.22	10,000	65
.764	0.1	.04	2,000	847
.190	2	.21	5,000	527
.034	32	.60	37,000	697
.006	724	2.41	72,000	239
.006	15,070	50.13	1,130,000	3,759
.734	0.1	.01	2,000	176
.191	2	.05	5,000	115
.043	32	.15	37,000	191
.020	724	1.74	72,000	173
.012	15,070	21.70 / 201 ac/fire	1,130,000	1,627 / $8501/fire

Unplanned:	17,596 ac/yr	$744,178/yr
Planned:	+ 5,000 ac/yr	+$ 50,000/yr
Total:	22,596 ac/yr	$794,178/yr

$\frac{\$8,501/\text{fire}}{201\ \text{ac/fire}} = \$42/\text{ac}$

$\frac{\$794,178/\text{yr}}{22,691\ \text{ac/yr}} = \$35/\text{ac}$

APPENDIX

D

INFORM AND INVOLVE PLAN

To gain the level of support and acceptance necessary to establish and maintain a successful prescribed natural fire program, the following Inform and Involve Plan has been developed. This plan will serve as the vehicle from which overall Fire Management direction established in the Frank Church-RONR Wilderness Plan and specific Fire Management direction established in the Operational Wilderness Fire Management Plan will be conveyed to both the public and in-service personnel.

The action strategies are divided into four categories:

-- PLAN DEVELOPMENT - Those strategies that occurred during the Plan development and implementation. The primary thrust of this phase is education.

-- PLAN REVISIONS - Those strategies that occur relative to Plan revisions.

-- ANNUAL FIRE SEASON INVOLVEMENT - Those communication strategies that occur pre-season to disseminate information to adjacent Forests and Wilderness users.

-- PRESCRIBED NATURAL FIRE AND/OR LARGE WILDFIRE BURNING - Those strategies planned for the times when a prescribed natural fire and/or a large wildfire is burning. The primary thrust of this phase is information dissemination.

-- POST SEASON - Those strategies planned for post season information gathering and dissemination needs.

A. PLAN DEVELOPMENT:

	Task	Responsibility	Time Schedule
1.	Develop Fire Management Fact and Response Sheet for distribution with Wilderness Plan Alternatives.	Steering Committee Working Team	Went to the public 11/83 Report on Response Sheets completed 3/84
2.	Develop presentation for in-house family meetings on plan development and final plan content; develop follow-up presentations after plan implementation.	Working Team Forest Fire Staffs District FMO's Forest IO's District Resource Asst.	After final plan approval then follow-up as needed
3.	Develop presentations for the public to educate them on prescribed natural fire in the Frank Church-RONR Wilderness.	Forest Fire Staff District FMO's Assistance from Forest IO's District Resource Asst.	Ongoing after final plan approval

Task	Responsibility	Time Schedule
4. Develop a handout on prescribed fire in the Frank Church-RONR Wilderness.	Working Team Forest IO's Forest Fire Staffs	Ongoing after final plan approval
5. Prepare articles outlining Fire Management Plan content.	Working Team Forests Regions	July 1985, then as needed to keep the public current on plan status
6. Prepare article on Draft Plan.	Steering Committee	April 1985

PLAN REVISIONS:

Task	Responsibility	Time Schedule
1. FY-87 revisions to Plan. See 87 Revisions in front of Plan.	Working Team Forest Fire Staffs	Completed 05/87
2. Develop news releases and letter relative to updates in Plan from policy changes coming from recommendations by Prescribed Fire Task Force.	Working Team Steering Committee	By May 15, 1989
3. Developed signs and procedures to use them.	Working Team Forest Fire Staffs District FMO's Forest IO's District Resource Asst.	April of 1989 Update as needed

ANNUAL FIRE SEASON INVOLVEMENT:

Task	Responsibility	Time Schedule
1. Develop presentations for temporary employees who will be involved directly or indirectly with the prescribed fire program.	Forest Fire Staffs District FMO's	By June of each year
2. Make contact with private in-holders and special-use permittees to explain the Fire Management Plan and the provisions provided in it to protect their interests.	District Rangers Dist. Resource Asst. District FMO's	Between February and July of 1985 then update as needed

	Task	Responsibility	Time Schedule
3.	Prepare articles on prescribed natural fire in wilderness.	Forests Regions	By May then as needed to keep the public current.
4.	Disseminate to other Forests 1 & 1 contact lists, procedures, and methods.	District Rangers District Res. Asst.	Yearly by January 1
5.	Post "FIRE INFORMATION" signs at Wilderness portals. Examples enclosed at end of 1&1 Plan.	District Rangers Dist. Resource Asst. District FMO's	At start of fire season. Replace as needed.

PRESCRIBED NATURAL FIRE and/or LARGE WILDFIRE BURNING:

	Task	Responsibility	Time Schedule
1.	Keep appropriate line officer(s) briefed on current and expected fire status.	Prescribed Fire Mgnt. or WAC	At initial fire start, then as needed or requested.
2.	Post "FIRE CAUTION" signs at appropriate Wilderness portals. Coordinate with adjacent Forests	Prescribed Fire Man. District Rangers District Res. Asst. District FMO's	When a rescribed Natural Fire and/or Wildfire is burning in the area.
3.	Determine need for fire closure. Coordinate with adjacent Forests.	Forest Supervisor District Ranger Prescribed Fire Man. District Res. Asst. or WAC	Determined by current and expected fire status.
4.	Post "FIRE CLOSURE" signs at appropriate Wilderness portals. Coordinate with adjacent Forests.	Prescribed Fire Man. District Ranger District Res. Asst.	Whenever closure is put into effect for area, trail, and/or road.
5.	Keep appropriate political contacts (Federal, State, & Local) appraised of current and expected prescribed natural and/or wildfire status.	Regional Office Forest Supervisors Forest Fire Staffs District Rangers Prescribed Fire Manager or WAC District FMO's	As appropriate based National, Regional & Local fire situation.

POST SEASON :

Task	Responsibility	Time Schedule
1. Prepare news articles at the end of fire season summarizing the past seasons fire activity.	Forest Fire Staffs District FMO's District Resource Asst. Forest IO's	November of each year Include in c.
2. Consider opportunities for 1-1 briefing of involved public. A combination briefing and critique.	Forest Fire Staffs District FMO's Dist. Resource Asst. Forest IO's	Within 3 months of close of fire season. Use existing opportunities such as Dec. O & G Meeting.
2. Conduct annual meeting of involved Forests to disseminate information and review Plan.	Steering Committee Chair Person	Yearly

WILDERNESS FIRE SIGNS

EXAMPLES :

1. FIRE INFORMATION
2. FIRE CAUTION
3. FIRE CLOSURE

6. News Media Releases :

Task	Responsibility	Time Schedule
a. All news releases will require Forest Supervisor and/or District Ranger approval.		
b. For single occurrence fires, to 100 acres, prepare news releases for the local news media	Prescribed Fire Man. Forest IO's Forest Fire Staffs District Rangers District FMO's District Resource Asst.	At initial fire start Then as needed or or requested
c. For multiple fires above 100 acres and for all fires above 100 acres prepare news releases for local, regional, and national news media.	Prescribed Fire Man. or WAC Forest Fire Staffs District Rangers Forest/Regional IO's District Resource Asst.	At initial fire(s) start Then as needed or requested
7. Keep appropriate in-service personnel; wilderness rangers, clerks, etc.; briefed on the status of Wilderness fire situation.	Forest Supervisor District Rangers Forest Fire Staffs Prescribed Fire Man. or WAC	As fire status changes
8. Keep appropriate out-service personnel; visitors, outfitters, local communities, etc. briefed on Wilderness fire situation.	Forest Supervisors Fire Staffs District Rangers Prescribed Fire Man. or WAC	As fire status changes
9. Develop slide and video programs from ongoing wilderness fires both prescribed natural and wildfires to use in presentations.	District FMO's Forest IO's Prescribed Fire Man. Prescribed fire Monitors District FMO's District Resource Asst.	Ongoing fires

APPENDIX

E

PRESCRIBED NATURAL FIRE BURN PLAN

1	FIRE NAME:	ADMINISTRATIVE #:
2.	APPROVAL	
	Staff Recommendation _____ Date _____	Line Officer Approval _____ Date _____
3.	General Information on Ignition	
	A. Location Wilderness/Area:	Area Subunit (if applicable):
	Ranger District:	National Forest:
	Legal or Latitude/Longitude:	
	B. Features Fuel Type:	
	Aspect:	
	Elevation:	
	C. Conditions ERC:	
	Palmer Drought Index:	
	Date of Start:	
4.	Map of Maximum Allowable Perimeter Based on Resource, Social/Political or Organizational Capability Constraints. (Attach to the plan.)	
5.	Map of Fire Projections For:	
	A. Normal fire behavior and seasonal duration - include estimate of date fire should become inactive. (Attach to the plan.)	
	B. Severe fire behavior and/or seasonal duration - include estimate of date fire should become inactive. (Attach to the plan.)	
6.	Holding Plan:	
	A. Probable actions needed to maintain fire within the maximum allowable perimeter and the timing of their implementation. (Use supplement sheet if necessary.)	

	B. Resource needs to implement above actions; and/or to manage burn to conclusion.			
	Resources	Type	Duration	Cost
	Aircraft			
	Individual Personnel			
	Crews			
	Equipment			
	C. Total cost of monitoring/holding actions estimated for burn.			
7.	Contingency Plan: (Use supplemental sheet if necessary.) A description of the planned contingency action necessary should the fire escape prescription and be declared a wildfire.			
8.	Risk Assessment: A. Type of prevalent fire expected such as high intensity stand replacement or medium to low intensity underburn and probabilty of holding to maximum allowable perimeter considering expectant weather and long term drought situation.			
	B. Evaluate the anticipated impacts on the following for the fire's expected duration. 1) Threat to life and property:			
	a. Permanent or intermittent users:			
	b. Private inholdings and private lands outside planned areas:			
	c. Agency facilities and/or equipment:			
	d. Special use and other permanent improvements:			

	2) Fire's expected impact on:
	a. On site occupants, visitors and users:
	b. On site resources and facitlites:
	c. Off site occupants, visitors and users:
	d. Off site resources and facilities:
	C. Probable smoke impacts considering prevailing wind patterns, available fuels and expected duration of activity.
	D. Agency Obligations:
	1. Probable availability of funds to cover costs identified in the holding plan. (YES/NO)
	2. Coordination locally or Regionally to identify probable resource needs and their availability as identified in the holding plan. (YES/NO)
	E. Other Management Actions
	1) How will additional starts within the maximum allowable perimeter be dealt with relative to this ignition:
	2) How will additional starts within the Forest and adjacent Forests be dealt with relative to this ignition:
9.	Monitoring actions needed to provide the prescribed fire manager with current status and estimates of protential fire action:

PRESCRIBED NATURAL FIRE BURN PLAN (Continued)

10.	Information Plan: A. External
	B. Internal
11.	Listing of criteria which will be reviewed daily by line officer to revalidate prescribed fire status:
12.	Checklist for documentation of daily revalidation by appropriate line officer: (Attach to plan.)
13.	Narrative evaluation of fire from both a resource effect and managerial perspective.

REVALIDATION RECORD

	CRITERIA MET		STATUS		
DATE	YES	NO	ACTIVE[1]	INACTIVE[2]	LINE OFFICER SIGNATURE OR INITIALS

[1] Use when fire is active or when forecast is conducive to fire becoming active – Fire perimeter growth expected to increase 10 percent or 10 acres whichever is less.

[2] Use when fire is inactive but not out.

APPENDIX

F

FIRE MANAGEMENT PLAN

FIRE OBSERVATION REPORT

Fire Name:_____ 2. #_____

Date of Observation:_____ 4. Time of Observation_____

Legal ___¼ ___¼ Section____ Township_____ Range _____

Exposure:_____ 7. Position on Slope:_____

Elevation:_____ 9. Wind Direction:_____

Wind Speed:_____ 11. Size at Observation:_____

Smoke Volume:_____ 13. Fire Behavior:_____

Fuel Model:_____ 15. Current 3-day mean ERC:_____

Fire Behavior Potential (Potential size, fuels, terrain and predicted fire weather)

_____

_____

_____

_____

_____

Smoke Management:_____

_____

_____

_____

_____

Fire Management Decisions:_____

_____

_____

_____

_____

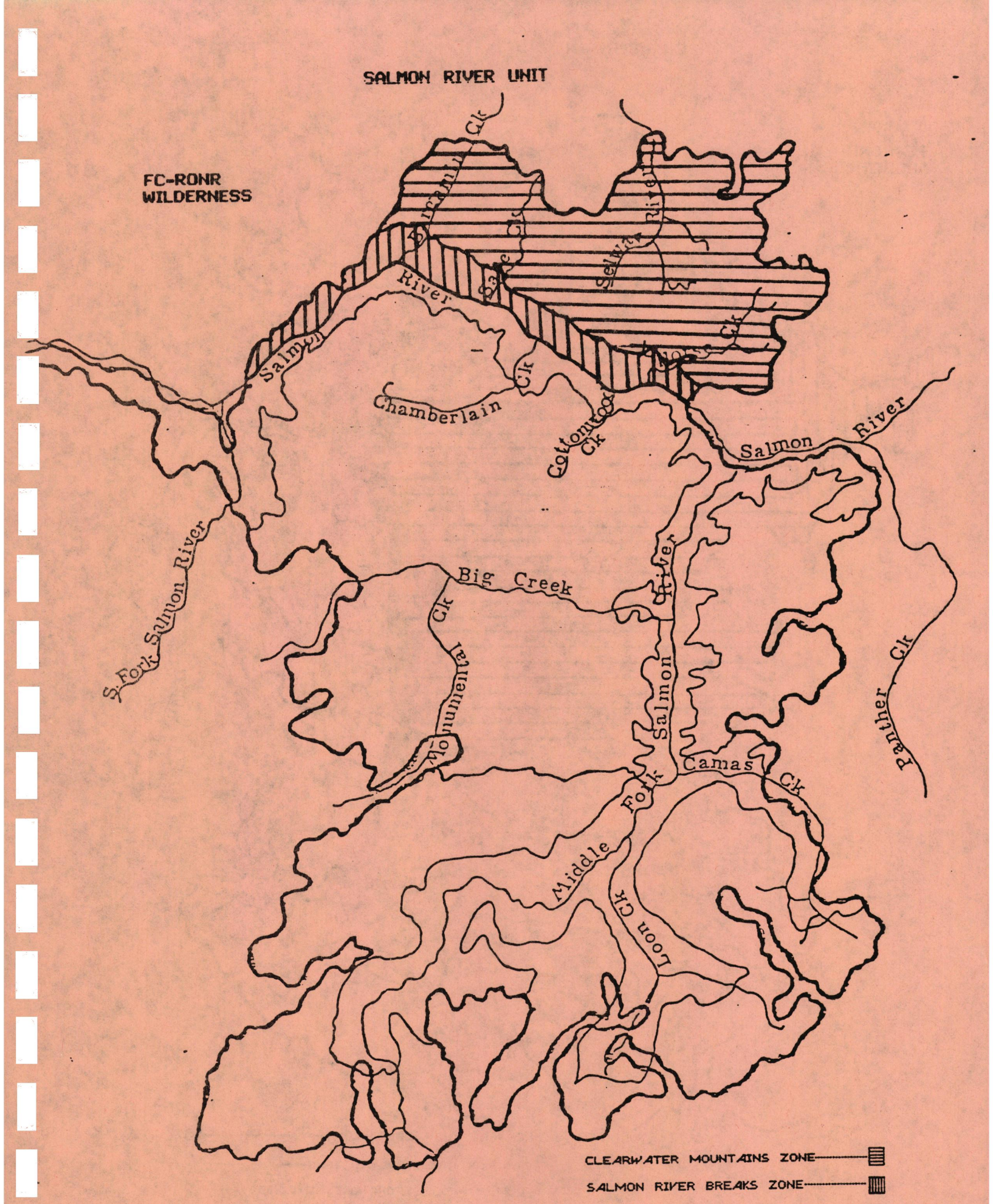
_____

_____

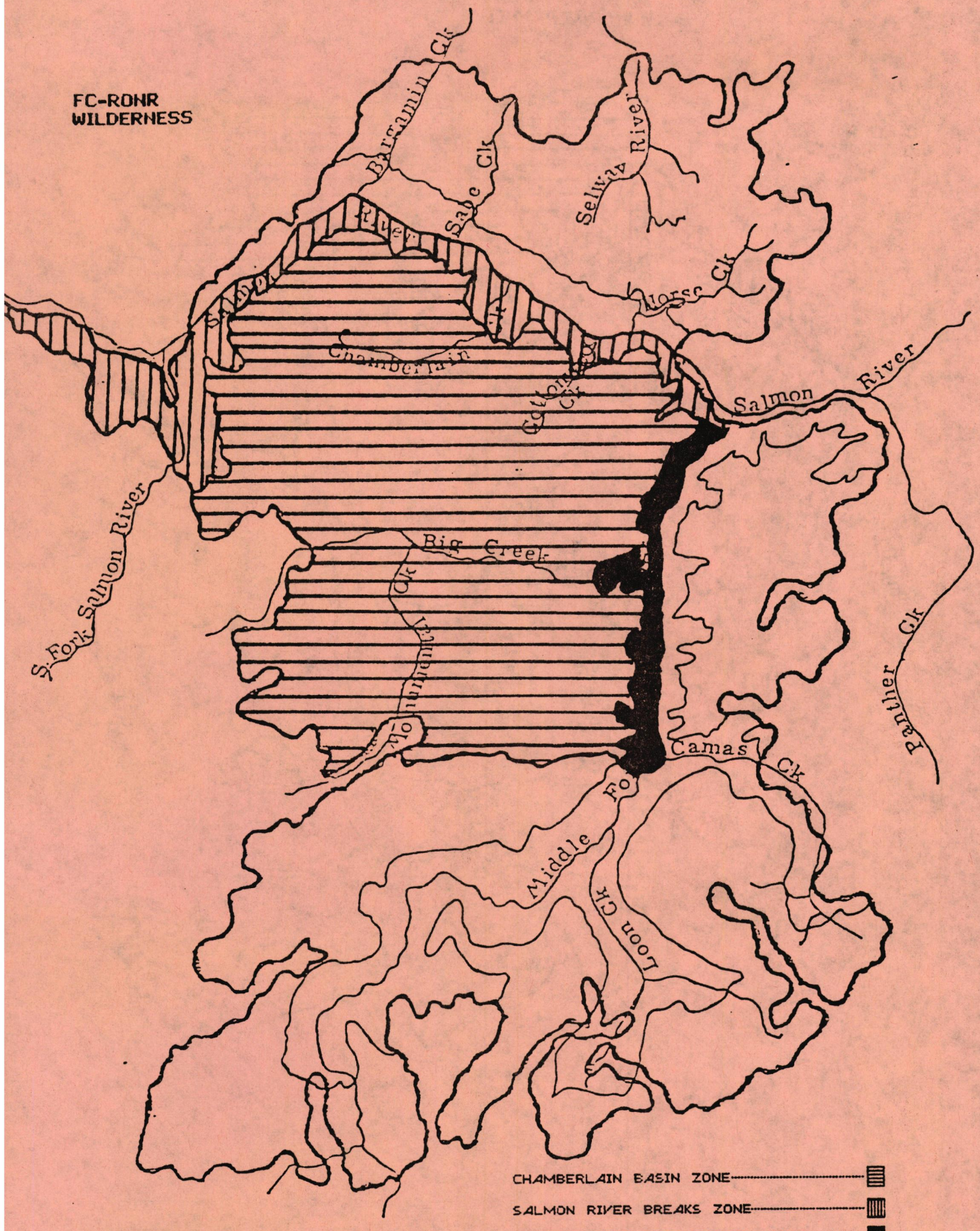
Observer:_____

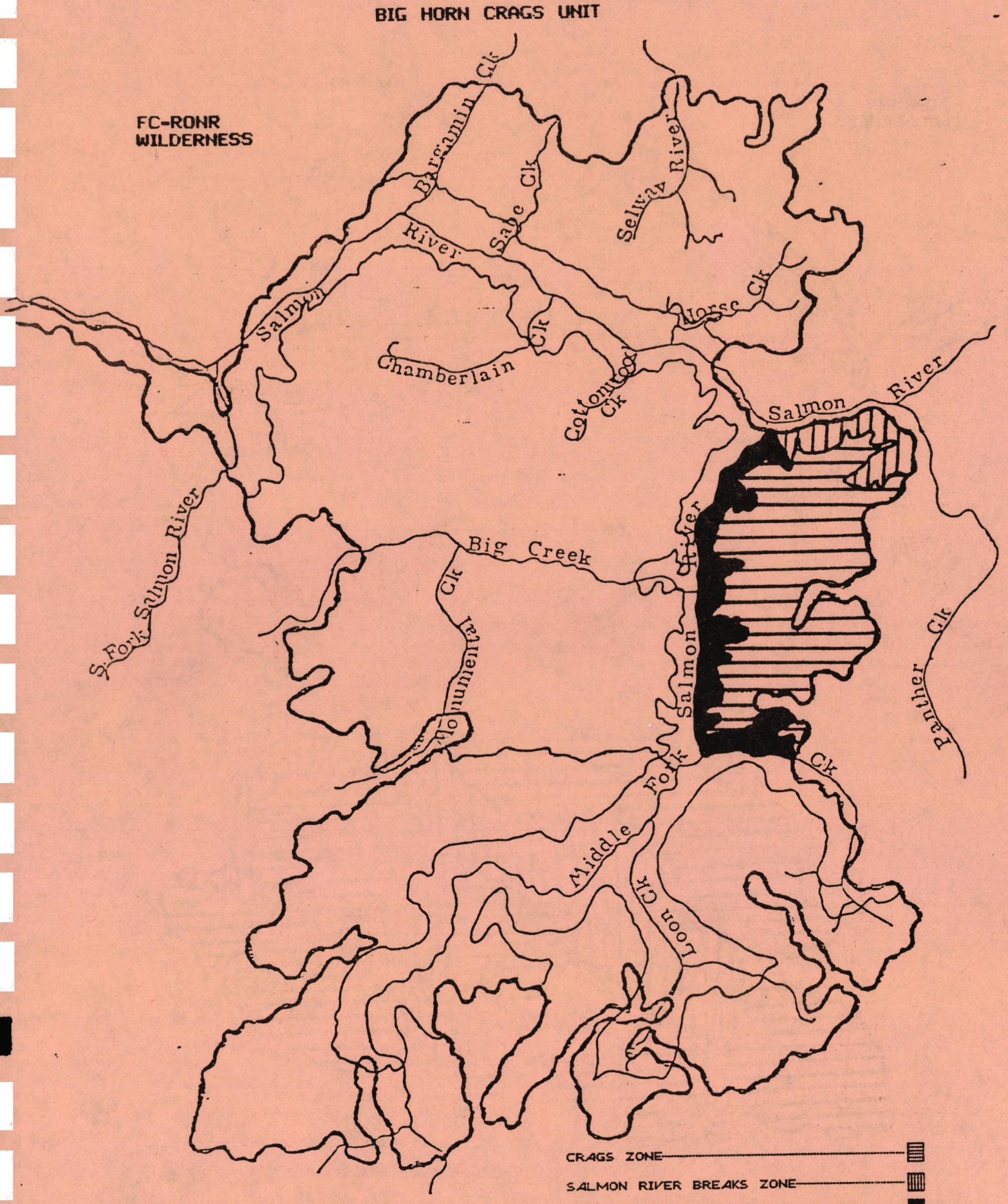
APPENDIX

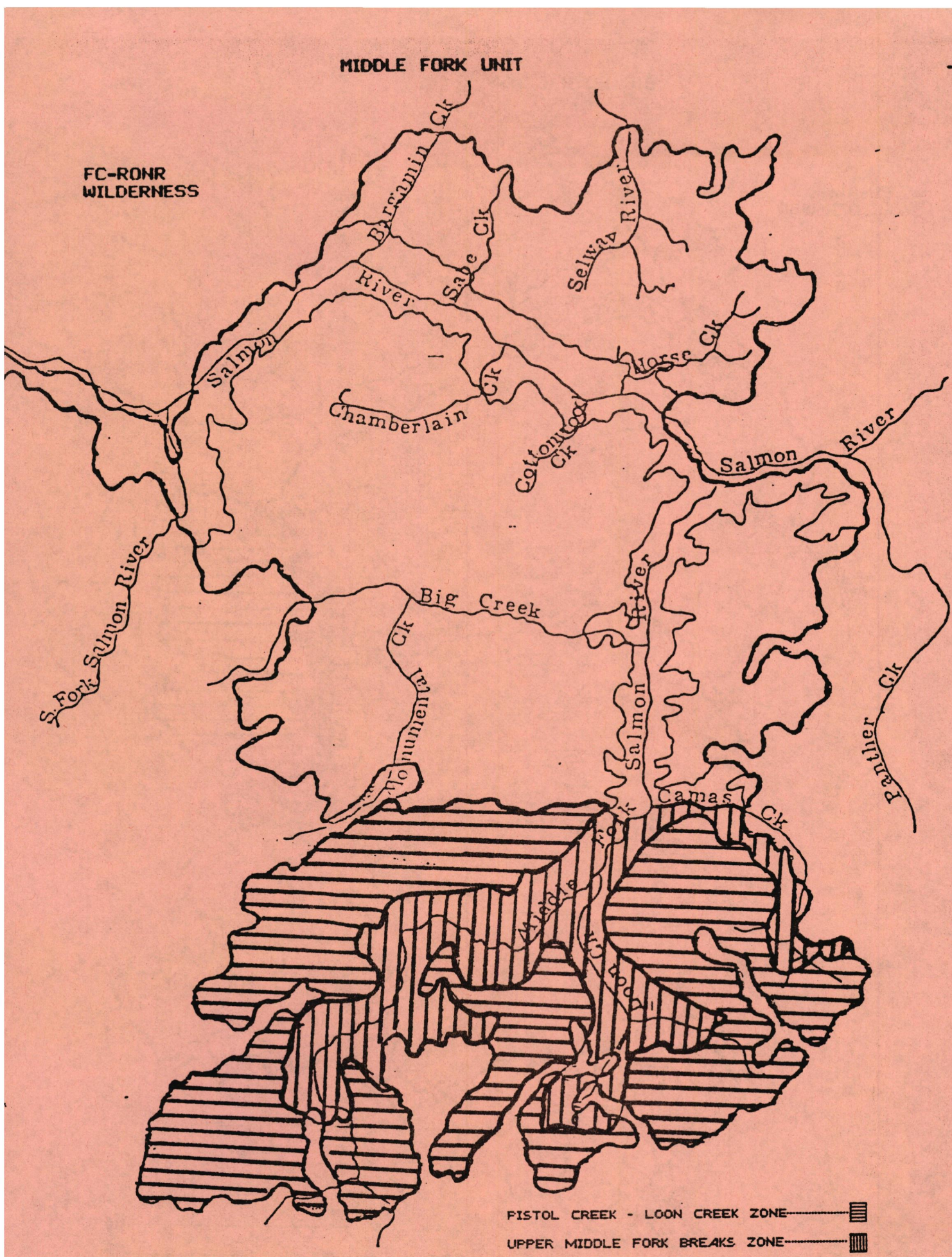
G


SALMON RIVER UNIT
FC-RONR
WILDERNESS
Indian Clk
Selway River
Salmon River
Chamberlain Clk
Cottonwood Clk
Salmon River
S. Fork Salmon River
Big Creek
Monumental Clk
Salmon River
Panther Clk
Camas Clk
Middle Fork
Loon Ck
CLEARWATER MOUNTAINS ZONE
SALMON RIVER BREAKS ZONE

CHAMBERLAIN UNIT

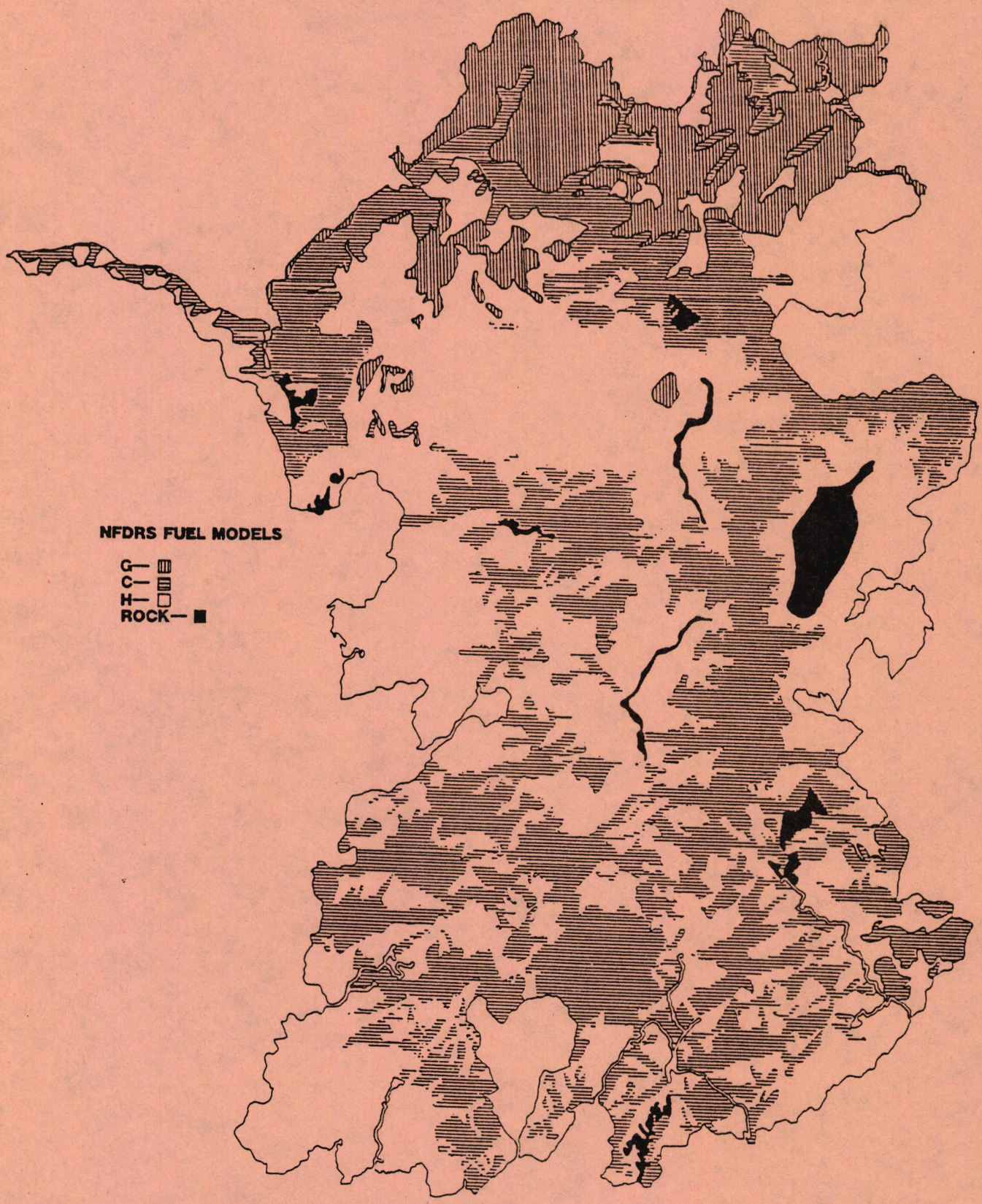



BIG HORN CRAGS UNIT
FC-RONR WILDERNESS
Bargamin Clk
Sabe Clk
Selway River
Salmon River
Horse Clk
Chamberlain Clk
Cottonwood Clk
Salmon River
S. Fork Salmon River
Big Creek
Monumental Clk
Salmon River
Panther Clk
Middle Fork
Loon Clk
CRAGS ZONE
SALMON RIVER BREAKS ZONE
LOWER MIDDLE FORK BREAKS ZONE


MIDDLE FORK UNIT
FC-RONR
WILDERNESS
Bargamin Ck
Sabe Ck
Selway River
Salmon River
Horse Ck
Chamberlain Ck
Cottonwood Ck
Salmon River
S. Fork Salmon River
Big Creek
Monumental Ck
Salmon River
Panther Ck
Camas Ck
PISTOL CREEK - LOON CREEK ZONE
UPPER MIDDLE FORK BREAKS ZONE

APPENDIX

H


NFDRS FUEL MODELS
G—
C—
H—
ROCK—

SIGNS

WILDERNESS VISITORS NOTICE

(REF: FSM 5153.1)

THIS TRAIL IS CLOSED TO PUBLIC USE

A lightning-caused fire is burning under natural conditions near this trail.

Concern for public safety prohibits access untill fire conditions change.

Hazards associated with fires include:

- *Rapid spreading of flames
- *Falling snags or trees
- *Heavy smoke and limited visibility
- *Rolling material such as rocks and logs

FIRE NAME:
FIRE LOCATION:

FOREST SERVICE
U.S.
DEPARTMENT OF AGRICULTURE

WILDERNESS VISITORS INFORMATION

(REF: FSM 5153.1)

You are entering _____

_____where some fires may be allowed to burn as part of a program to return fire as a natural force to the ecosystem. When traveling in the vicinity of a fire please use extreme caution.

For further information contact:

WILDERNESS VISITORS INFORMATION

(REF: FSM 5153.1)

You are entering _____

_____where some fires may be allowed to burn as part of a program to return fire as a natural force to the ecosystem. When traveling in the vicinity of a fire please use extreme caution.

For further information contact: